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SELECTED PAPERS.

Experiments on the Transfusion of Blood by the Syringe. By JAMES BLUNDELL, M. D. Lecturer on Physiology at Guy's Hospital.

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A FEW months ago I was requested to visit a woman who was sinking under uterine hemorrhagy. The discharge had stopped before my arrival, but her fate was decided, and notwithstanding every exertion of the medical attendants, she died in the course of two hours.

Reflecting afterwards on this melancholy scene, for there were circumstances which gave it a peculiar interest, I could not forbear considering, that the patient might very probably have been saved by transfusion; and that, although there was little opportunity for operating in the usual manner, the vessels might have been replenished by means of the syringe with facility and promptitude. As it seemed doubtful, however, whether the blood would remain fit for the animal functions after its passage through the instrument, the following experiments were instituted with a view to ascertain the point; and they are now submitted, with all their imperfections, to the consideration of the society; under the hope, that they may

contribute a little to excite the attention of the medical philosopher, and recommend a neglected operation to the experimental investigation which it seems to deserve.

The femoral* vessels of the dog were laid bare *at the groin;* and a pipe, sufficiently large to fill the artery, was introduced with its extremity toward the heart. On removing the ligature, which had been thrown around the vessel to prevent a premature discharge, the blood rushed out with such impetuosity, that eight ounces escaped in the course of two minutes, and the discharge soon afterwards ceased. From this discharge of blood, the most alarming symptoms arose; distress and gasping, struggling and convulsions, and at length a profound fainting, marked by stoppage of the circulation, by insensibility, and by a complete relaxation of the abdominal muscles.

In this condition the animal was suffered to lie for a few seconds, when six ounces of blood, taken from the artery of another dog, were injected into the femoral vein, in a manner which will be hereafter described. In consequence of this operation, it soon revived; the abdominal muscles became firm, and the respiration regular, sensibility was restored, and the blood again circulated, indeed so briskly, that it pushed away the concretion which had formed in the femoral tube, and rushed out. So sudden and complete was the resuscitation, that the animal seemed rather to awake from sleep, than arise from apparent death.

To give this experiment (which will be found in the annexed register, together with various repetitions,) all its force, it may be proper to observe, that the combination of symptoms just enumerated is mortal, and that whatever the symptoms be, the dog invariably dies, when left to its natural resources, if the blood is suffered, as in this instance, to flow from the femoral tube, until the discharge spontaneously ceases. Transfusion alone can save it.

From facts like these it is evident, that the transmission of blood through the syringe, does not unfit it for the animal purposes; but as this is a principle, which lies at the bottom

* Register, Experiment 2.

of the whole operation, it may be proper to confirm it by the following experiments.

The femoral* vessels of the dog were laid bare as before; and a pipe was introduced into the artery and vein. Then, by means of the syringe, which will be hereafter described, the blood which was suffered to flow into a cup from the artery, was directly returned into the vein; and this operation was continued, not for a few seconds only, but for twenty-four minutes. Yet the dog sustained but little injury.

It should be observed here, that if the blood be suffered to flow in a full stream from the femoral artery of a dog below the middle size, about half a pint will be discharged in the course of two minutes; but as this operation was carried on for twenty-four, and the artery gave off its blood impetuously during the whole time, it follows, that twelve pints of blood must have entered the cup, and been transmitted by the syringe to the veins. The whole weight of the dog, however, did not equal twelve pounds, and hence it is obvious, that the same blood must have passed the syringe repeatedly; a conclusion which is confirmed by the highly arterial characteristics, which the blood had acquired, when the operation terminated. This experiment will be found, together with repetitions, in the appendix; and proves, like the former, perhaps in a still more impressive manner, that blood may be transmitted through the syringe, and this too repeatedly, without becoming unfit for the purposes of life.

From this principle it may be inferred, that the transfusion of human blood by the syringe to the veins of a human subject, may be attended with the most important advantages; but as accidents may occur in attempting the operation, it is necessary to ascertain how far they will affect its success.

Although the blood sustains but little injury when discharged into the cup and promptly transferred to the veins, it seems to suffer in some way or other if the transfusion be delayed.

A dog† was drained by the femoral artery, and replenished by the vein; but in performing this experiment, the human blood was injected instead of the canine, and it was suffered

* Register, Experiment 6.

† Register, Experiment 8.

to be in the cup between fifty and sixty seconds before it was thrown in. The animal expired on the table. At first indeed it revived, the blood circulated, the respiration was renewed, and sensibility was restored; but these flattering symptoms were of short duration, and in the course of a few minutes it died.

In a second* experiment, conducted in the same manner, but with this difference, that the blood remained in the cup for thirty seconds only instead of sixty, the resuscitation was complete, as the animal, though languid, was able to walk, and became so lively and sensible, that it took a pleasure in being caressed. Yet it died in the course of twelve hours.

From a cursory survey of these and similar experiments, it appears that the blood, by lying in the cup between thirty and sixty seconds, is rendered unfit for the purposes of life. Although, however, on a first view they appear conclusive, they are in reality liable to some strong objections, arising out of a principle which I shall next endeavour to elucidate.

It has been very generally asserted, that the blood of one kind of animals may be substituted with impunity for that of another; and that the dog, for instance, would suffer but little inconvenience, if it were drained of its own blood and replenished from the sheep. This principle, however, which is now seldom controverted, is rendered extremely doubtful by the following experiments.

Three† dogs were drained of their own, and supplied with human blood, in the manner already described; only the injection was performed without delay; for the blood was taken up by the syringe while flowing into the cup, and injected into the vein immediately. Yet all these dogs, although they recovered for a time, died, one of them in a few minutes, another in a few hours, and a third several days afterwards. The last, indeed, appeared for a time likely to recover, but it died with a dropsy of the pericardium. It is proper however to add, that another dog, on which a similar operation had been performed by Mr. Goodridge of Barbadoes, a gentleman who was at that time finishing his studies at the United

* Register, Experiment 7. † See Register.

Hospitals, eventually recovered. The truth is, the constitution of this animal was so vigorous that it resisted the shock; and yet, for a few hours after the operation, a variety of unfavourable symptoms occurred. This experiment, therefore, is in reality in unison with my own; for it is not contended that the exchange of blood *necessarily destroys* life, but merely that it *may sometimes endanger* it.

These experiments acquire additional strength, when associated with others instituted by Dr. Leacock (also of Barbadoes) a few months before; experiments to which I was wholly indebted for my first notions upon this subject. From these it appears, that if a dog is drained of its blood *until apparent death is produced*, it may indeed be revived for a time, and very completely too, by replenishing it from the sheep; but it generally dies in a few days afterwards.

Connected with my own, these experiments of Dr. Leacock possess a peculiar interest; for although they harmonize with them in the general result, they differ materially in their circumstances. It was arterial and not venous blood; the blood of the sheep, and not the human that was substituted; and it deserves *particular notice, that the transfusion was not performed by the syringe*, a method of operating with which he was unacquainted, but simply by the tube.

In considering what has just been advanced, two reflections occur to the mind: first, that transfusion by the syringe powerfully recommends itself, as it enables the operator to inject human blood into human veins; and secondly, that it invalidates the experiments already related, which seemed to prove, that the delay of the blood in the cup renders it unfit for the animal purposes. These were performed with the human blood; and it is obviously difficult to determine, whether death must be attributed to the delay in the cup, or to the substitution of the human blood for canine. Nor in operating on the dog can this objection be avoided; for its own blood coagulates so rapidly, that it cannot be employed. The subject deserves further investigation.

In transfusing human blood by means of the syringe, it is obviously the venous and not the arterial blood that must be injected; for although it would be easy to induce an attendant

to submit to the common operation of bleeding, there are few perhaps but would object to the opening of an artery, even the temporal itself. It is of importance, therefore, to remark, that the venous blood seems to revive an animal, as well as the arterial.

A dog* was drained of its blood by the femoral artery till apparent death was produced; a fresh supply was then injected in the usual manner by the vein. In performing this experiment, however, venous blood was substituted for the arterial; yet the animal recovered, nearly in the same manner as if arterial blood had been transfused. This experiment was the more decisive, as the dog was suffered to lie for a few seconds in a state of apparent death before transfusion was attempted.

In transfusing blood by the syringe, there is a risk lest air should be introduced. To ascertain whether this accident would occasion death, five† drachms of atmospherical air were injected into the femoral vein of a healthy dog, which was scarcely larger in the body than a full sized cat, in quantities of a drachm at a time: but the animal suffered very little injury. It is true, indeed, that deep sighing recurred during the operation, that the pulse became very irregular, and the muscular system tremulous; but these symptoms are produced independently of experiment, from the mere alarm occasioned by tying the animal to the table. The general health, however, certainly suffered. There was restlessness, vomiting, and a continuance of the muscular tremor; and this, it may be remarked, together with the small size of the animal, rendered it difficult to observe the pulse. On the other hand, however, the restlessness continued for a few hours only, and the vomiting occurred but once; the appetite was little impaired; the animal recovered in three days; and during the whole of this period, no symptom of immediate danger occurred. Yet compared with the small size of the animal, the quantity of the injection was large.

In a second‡ experiment upon the same dog, about three drachms of air from the lungs were blown into the femoral

* Register, Experiment 12. † Register, Experiment 13.
‡ Register, Experiment 14.

vein, without even producing much *temporary inconvenience;* so that it seems indisputable, that small quantities of air may enter the vessels without destroying life.

Nor is this principle, which is confirmed by similar experiments of Dr. Haighton and others, materially invalidated by those which have been made upon the horse. For although it be granted that this animal may be killed by blowing air into the veins; this solitary fact can bear with little weight upon the present question, unless the quantity of the air, and the manner of its introduction be also ascertained.

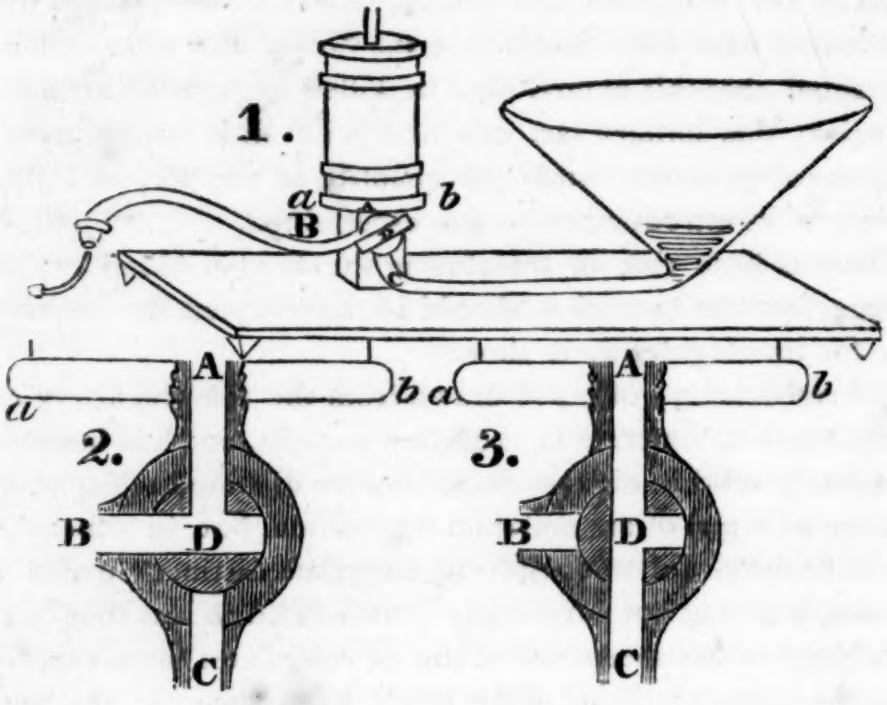
There is little risk in transfusing the human blood by the syringe, lest the operation should be interrupted by concretion; for its coagulation is slow.

Three* drachms of blood drawn from the femoral artery of a dog, began to concrete in about ten seconds, and had become completely solid in eighty. But an ounce of blood taken from the arm of a girl of an epileptic disposition, but in other respects healthy, did not begin to coagulate distinctly under a minute, and was not completely consolidated in less than six. The blood of the sheep and of the ox coagulates more rapidly than the human†. Now if the dog's blood may, as the preceding experiments prove, be transfused by the syringe without material obstruction from concretion, there can be no difficulty in transmitting the human blood, which requires five times the interval for its coagulation. Indeed, no obstructions of this nature occurred even in conducting those experiments, in which the human blood was suffered to lie in the cup for several seconds before it was injected.

It may be proper to remark, that in executing these experiments, both water and weak wine were injected with impunity, and the instrument was not warmed.

* Register, Experiment 15. † See Register.

The apparatus used in these experiments, and which it may now be proper to describe, consists of four different parts: the syringe, the cup, the tubes, and the frame.



(Fig. 1.) Exhibits the syringe, &c.
(Fig. 2. 3.) The structure of the double-way cock.
A *a b* the head of the syringe.
A D B (Fig. 2.) the channel by which the blood is expelled: while A D C is closed.
A D C (Fig. 3.) the channel by which the blood enters: while A D B is closed.
The change is effected by giving the plug D a quarter-turn.

The syringe is constructed in the usual manner; the cup, which is designed to collect the blood, is funnel-shaped; but the tubular part is a little more complicated. It consists of two pipes, with a double-way cock. Of these pipes, one is intended to discharge the contents of the syringe; and is connected by one extremity to the nozzle, and by the other, when the instrument is in action, to the tubule which is inserted into the vein. To this venous tube it fixes by sliding over the end, so that the two may be easily disunited; but it is connected

to the syringe itself by means of a screw upon the side of the nozzle, in such a manner as to lie at right angles with it.

The other pipe, which is designed to conduct the blood from the cup to the syringe, is united at one extremity to the end of the nozzle, and at the other to the bottom of the cup, the point of which opens into it. Of course this pipe is formed with a rectangular curve at either end, so as to give an upright position to the cup.

The two-way cock, which completes the instrument, forms a part of the nozzle; and making a quarter turn, throws open the tube which discharges, and closes that which admits the blood; or the contrary, according to the position in which it is placed.

The whole apparatus is mounted perpendicularly on an upright post; and the floor on which this rests is poised with lead, in order that the operation may not be embarrassed by the instability of the instrument. The joints are air-tight.

The syringe, which was made by Laundy, of St. Thomas's Street, Southwark, is of brass. Its capacity, which, however, admits of regulation by means of a check on the piston, is eleven drachms; small, in order that the blood may not be thrown into the vessels too rapidly, nor detained too long; and of a determinate size, in order that the operator may measure the quantity of the blood which he injects.

In constructing this instrument, the tube which discharges should be made of very pliant leather; and that which admits the blood, may be formed of the flexible metal used for catheters: the first, to prevent the tubule from *wriggling* in the vein during the injection, if the apparatus should move or the animal be restless; and the last, in order that the situation of the cup may admit of more ready adjustment. For the same reason, the upright post, to which the syringe is to be fixed, although it should not move too easily, may be made to turn round.

Various valvular contrivances might be suggested, to command the orifices of the tubes where they unite with the syringe, and give the proper course to the fluids it propels. The two-way cock, however, although it is liable to objections, possesses advantages over every other apparatus of this na-

ture, as it is less liable to be clogged with blood or otherwise deranged, and as it may very easily be made air-tight.

The manner of using this instrument, should it be thought proper to operate with it upon the human vessels, may be easily understood. For this purpose, a vein should be opened in the arm or hand of the patient, and a pipe introduced; then, by the common operation of bleeding, blood should be drawn into the cup of the syringe from the arm of an attendant, and injected without hurry or delay.

In performing this injection, the piston should be played with one hand, while the cock is managed with the other; in such a manner as to allow the blood to enter and escape by the respective tubes.

Before the injection commences, we must expel the air from the tubes, and ascertain that the apparatus is tight. The air is most conveniently expelled by filling the tubes with water, as the small quantity used for this purpose will produce no inconvenience when injected into the veins.

The tightness of the instrument is essayed, by putting a few ounces of water into the cup, opening the cock upon the tube of admission, and playing the piston rapidly; for if no bubbling appear, after the air which had lodged in the apparatus has been expelled, it is secure. If the water used in this essay is tepid, it will give a proper temperature to the instrument.

It should be the task of an assistant to take care that the cup never become empty, as air would be drawn in; and this is an accident which the operator himself may prevent, by regulating the injection according to the supply.

On the other hand, however, the blood should never be suffered to accumulate in the cup in too large a quantity. Should it indeed be hereafter ascertained, that the human blood may lie out of the vessels for several seconds, or till it begins to coagulate, without becoming unfit for the animal purposes, it would then perhaps be better, if this instrument were used at all, to draw half a pint of blood into the cup at once, or at least to keep it pretty full; but until this principle is confirmed by *numerous*, *pointed*, and *cautious* experiments, such a method of operation would be unjustifiable.

It may be objected to transfusion in every shape, that the

tube may excite inflammation of the vein. In weighing this and similar o jections, however, it should not be forgotten, that in the present state of our knowledge, at least, the operation would be justifiable in the most desperate cases only, when it seemed the only mean of saving the life of the patient. There is much good sense in the familiar maxim of Celsus, and in the present case it is peculiarly applicable; for surely it is better to incur the uncertain risk of venous inflammation, than to leave the patient to his fate. Besides, it is not necessary to tie the pipe in the vein; it may be easily secured by the pressure of the finger, or the blood might be injected by an artery.

Although I have described the manner of using this instrument, it is by no means my design particularly to recommend it. Many, perhaps, will think that the common syringe, a little altered in its construction, would perform the operation equally well; and I know that it was successfully employed by Mr. Goodridge in the experiments to which I have already alluded. Indeed, should it clearly appear from future observation, that the entrance of a few bubbles of air into the human veins, or the delay of the blood for a few seconds in the cup or the syringe, does not endanger success; perhaps no reasonable objection could be urged against this instrument, and it strongly recommends itself by its portability and simple structure.

In pointing to some of the advantages which belong to transfusion by the syringe, I shall not enter into details. I forbear therefore to enlarge on the facility of the operation, or its uses in physiological research; and shall content myself with touching upon three advantages, which appear the most important.

This operation may be performed with *promptitude;* for the human blood is always at hand, and the instrument may be easily provided, as the danger of uterine hemorrhagies, at least, may frequently be foreseen. Promptitude of operating is no inconsiderable advantage, for the apparent death of hæmorrhagy soon becomes irremediable.

If a dog, drained of its blood, be suffered to lie in a state of asphyxia for a few minutes only *after respiration has ceased*, transfusion itself, aided by the hot bath and artificial respiration, will not revive it. This at least is the general result of

the *few* experiments which I have hitherto made; and it proves how speedily the apparent death of hemorrhagy is converted into the real.

Another advantage which arises out of this method of operating, is the abundance in which the blood may be transfused. A dog below the middle size, (and this variety, perhaps, is the most frequently found about our houses,) generally dies after it has given off from eight to twelve ounces of blood; but much larger quantities of *human* blood might be easily obtained from the attendants.

It must be confessed, however, that it is not necessary in cases of hæmorrhagy to throw into the vessels as much blood as they have lost; a very small supply, although it will not restore the energies of the animal, will preserve its life. This truth, which is in some measure established by the result of the first experiment, is so generally admitted, that it is unnecessary to enlarge upon it; yet I cannot forbear adding, that it seems to deserve a more minute investigation than it has hitherto received.

But of all the advantages derived from transfusion by the syringe, by far the most important is the opportunity it offers of throwing human blood into human veins. There seems reason for surmising, from facts already related, that the blood of one class of animals cannot be substituted, in large quantities, for that of another with impunity; and hence it becomes of the utmost importance, that we should be able to supply the human vessels with the human blood. Every other method of transfusion with which I am acquainted, is exposed to this grand objection, that it transfuses the blood of the brute—a defect, from which the operation by the syringe is *exclusively* exempt.

REGISTER OF EXPERIMENTS

On the Transfusion of Blood from the arteries of one dog to the veins of another by means of the Syringe.

I. *History.*—A tube of the full size of the vessel was inserted into the femoral artery; and about ten ounces of blood were discharged in the course of two minutes. No more could be got away.

After the dog had been suffered to lie in a state of apparent death for a few seconds, two ounces of arterial blood taken from another were thrown by the syringe into the femoral vein, through a pipe introduced for this purpose with its extremity toward the heart.

Symptoms.—The first symptoms produced by the bleeding were distress, struggling, and laborious respiration; and these were soon followed by gasping, extreme relaxation of the abdominal muscles, and apparent death.

The distress is indicated by a peculiar sort of cry.

A few seconds after injection the animal revived; the abdominal muscles became firm, the respiration regular, and the circulation was renewed with such force, that the blood pushed a coagulum from the arterial tube and gushed out.

Observations.—As the dog was small, the quantity of blood drawn away may be regarded as considerable; and it should be observed, that the symptoms enumerated above are, as repeated experiments have proved, invariably followed by death, unless transfusion is performed.

This experiment not only proves, that transmission through the syringe does not unfit the blood for the purposes of life; but shows further, that to obviate the fatality of hæmorrhagy, it is not necessary to inject as much blood as has been lost.

II. *History.*—The blood was suffered in this, as in the preceding experiment, to flow as long as it would from the tube inserted into the femoral artery; and about eight ounces were discharged.

Six ounces were then injected as before, and the dog recovered.

Symptoms.—By this bleeding apparent death was produced, together with a whole assemblage of precursory symptoms, enumerated in the preceding experiment.

Observations.—This experiment, performed on the same dog as the preceding, is little more than a repetition of it; but a larger quantity of blood was injected.

III. *History.*—In this experiment the blood was drawn off in the same manner as in the preceding, the following differences excepted. It was drawn from the carotid, and not the femoral artery. It was not drawn at once, but at three different

times, a few seconds intervening. The dog was small, scarcely larger in the body than a male cat, so that no more than five ounces of blood could be got away.

After the apparent death had continued for a few moments, the blood of another dog was injected; not, however, till it had lain previously for a few seconds in the cup.

Symptoms.—Apparent death was produced, and preceded by the usual symptoms.

In a very few moments after the injection the dog recovered, and so completely, that he leapt from the table as soon as he was unbound. The pulse, indeed, for a little time after the operation was intermittent and unequal, but these symptoms are frequently produced by merely tying the animal to the frame.

Observations.—The lively health of this dog immediately after the operation, was strikingly contrasted with the languor of another, which was supplied in the same manner with the *human* blood instead of the *canine*.

It is obvious from these experiments, that blood is not rendered unfit for the animal purposes by passing through the syringe.

Transfusion by the Syringe from the arteries to the veins of the same animal.

IV. *History.*—In this experiment, a tube was inserted into the carotid artery and the external jugular vein; and the extremities of both were directed towards the heart. The syringe was then adapted; and the blood, which was suffered to flow into the cup from the artery in a full stream, was directly returned into the vein, in quantities of three or four drachms at once. In this manner, about six ounces were transfused; after which the operation was suspended for a few minutes. After this delay, six ounces more of blood were passed in the same manner through the syringe; only the blood was injected with less impetuosity, in quantities not exceeding three drachms at a time. After another pause, four ounces more were transfused; so that the aggregate quantity of the blood which passed through the syringe in this experiment was a pint. No air was suffered to enter into the vessels.

Symptoms.—The pulse occasionally intermitted in the first stage of transfusion, but there was no obvious change of temperature.

During the second and third stages, the temperature remained unaltered, and the heart seemed to beat naturally, without labour or intermission.

The dog was rather languid for a few hours after the operation, but recovered without the occurrence of any material symptom.

Observations.—It deserves remark, that in this experiment one pint of blood was passed through the syringe without serious inconvenience, although the *loss* of half a pint would have destroyed a dog of the same size.

The irregularity of the action of the heart arose, perhaps, in part from the injury the blood sustained in passing the syringe; but principally, as I suspect, from alarm, and from the manner in which the blood was thrown in; for as this was one of the first essays, the operation was not conducted, at the commencement especially, without a little hurry. It should be observed too, that in the first stage, three or four drachms, at least, were injected at once; and as these were thrown into the jugular vein, they must have passed directly into the right auricle—a cavity, perhaps, scarcely large enough to receive them without inconvenience. Accordingly, towards the close of the experiment, when the blood was injected more equably, and in smaller quantities at once, the action of the heart became more regular.

V. *History.*—This second experiment was executed in the same manner as the former, a few differences excepted: The blood was injected at four different times, instead of three; the injections were continued a greater length of time, and the last was pushed so far, that the blood which issued from the carotid artery, acquired the florid arterial colour in a *very high* degree.

Owing to the imperfection of the apparatus, about a drachm of air got into the vein.

Symptoms.—The pulse intermitted, in consequence of agitation, before the transfusion began; but during the operation these intermissions became more frequent, occurring every

five or six beats, so that the blood sometimes flowed impetuously, at others sluggishly, from the carotid artery. The respiration, however, on the whole, continued natural; and the temperature of the animal underwent no obvious change. Toward the close of the experiment, the intermissions became less frequent, and in a few minutes after ceased altogether.

The entrance of the air did not occasion any unusual symptoms.

Observations.—The most remarkable symptom occurring in this experiment, which was pushed to a much greater extent than the preceding, was the intermission of the pulse. This must certainly be attributed in part to alarm, for it was observed before the operation commenced; but it seems also to have arisen partly from the unequal and impetuous stream, in which the blood was thrown into the heart. It is obvious, that it cannot be ascribed to the arterial nature of the blood which was injected into the veins, or the changes it suffered in passing the syringe; for although the arterial characters of the blood were heightened as the experiment proceeded, and some of it at least had passed the instrument more than once; these irregularities, instead of increasing, became less and less frequent.

VI. *History.*—This experiment in the main resembled the preceding, but it was performed on the femoral vessels instead of the cervical, and the blood was injected at three different times.

The first transfusion was continued eight minutes, during which the blood was suffered to flow in a full stream from the femoral artery, and acquired the arterial characteristics in a high degree: the second was performed half an hour after the former, and continued for the same length of time: the third was carried on for the same period, after a pause of half an hour, and a few small concretions formed on this occasion in the cup.

Symptoms.—Before the transfusion began the pulse was unequal and intermittent, but became regular and distinct as it proceeded. It beat 150 times in the minute, which in this dog was nearly its natural frequency. The respiration was accelerated during the operation, and the dog occasionally

complained a little; but its temperature remained unaltered, and the animal ultimately sustained but little injury.

Observations.—The regularity of the pulse during this operation is very remarkable, especially if we consider its great irregularity in the preceding experiments. It must be recollected, however, that the transfusion was performed in this instance upon the femoral vessels, which are remote from the heart, and not on those of the neck.

Half a pint of blood flowed from the femoral artery of this dog in about two minutes; consequently about twelve pints must have been discharged in this experiment, and transmitted through the syringe, in twenty-four. The dog itself, however, weighed less than twelve pounds; and hence it is obvious, that the blood in the large arteries must have issued repeatedly, and repeatedly passed the syringe, which accounts for its heightened arterial character.

The formation of concretions deserves notice, as it proves that the blood in this animal remains fit for its peculiar functions, although certain parts have begun to coagulate.

From these experiments it appears, that the blood remains fit for the vital purposes, although it have *repeatedly* passed the syringe. They confirm the former.

Experiments in which the blood was exposed for a short time in the cup.

VII. *History.*—In this experiment pipes were introduced into the femoral vessels, and about ten ounces of blood were drawn from the artery, but no more could be got away. Immediately afterwards, about ten ounces of human blood were injected by the vein. This blood was taken from the arm, and about two ounces were suffered to accumulate in the cup, and to lie there for thirty seconds before they were injected. No air got into the vessels.

Symptoms.—Apparent death was produced by the bleeding, and the animal revived as usual in consequence of the injection: the pulse beat 120 times in the minute, and did not intermit; the respiration became regular, and the abdominal muscles firm. The extremities and ears felt rather cool; but this symptom is produced occasionally by merely tying the dog to the

frame. After the operation, the animal walked, took food, and appeared pleased with caresses; but it died within twelve hours afterwards.

Observations.—The dog on which this experiment was performed was aged, but healthy.

VIII.—*History.* This experiment was conducted like the former, but the dog was small, and only four ounces of blood could be drawn away, when a complete asphyxia was produced. The same quantity of human blood was injected, after it had lain in the cup for sixty instead of thirty seconds.

Symptoms.—The dog revived for a time, respiration and circulation were renewed, but the recovery was temporary, and it died on the table.

Observations.—The dog which was made the subject of this experiment was perfectly healthy, and though small, full-grown. The small quantity of blood drawn away, not exceeding four ounces, renders the death the more remarkable.

These experiments prove, apparently, that the blood is unfitted for its functions by lying between thirty and sixty seconds in the cup of the syringe; but they are invalidated by those which follow.

Experiments in which the dog was drained of its own, and supplied with human blood.

IX. *History.*—More than seven ounces of blood were in this experiment drawn from the femoral artery, and six ounces of human blood were injected in their stead. This was received in the cup of the syringe as it flowed from the arm, and thrown directly but tranquilly into the vein.

Symptoms.—In consequence of the bleeding, the usual symptoms were produced, and terminated in profound fainting; but the dog revived after the injection. Sensibility was restored, together with tension of the abdominal muscles, respiration, and a circulation so active, that the blood gushed from the arterial tube. These symptoms, however, continued a few seconds only, when the action of the heart became very irregular, and the dog gasped, gaped convulsively, made ineffectual attempts to vomit, and died.

Observations.—This dog was rather large, very lively, and

did not undergo much fatigue during the operation. It will be observed too, that the quantity of blood drawn away was not very large, considering the size of the animal, and that a temporary revival was produced; circumstances which make death the more remarkable. Preceding experiments put it, I think, beyond a doubt, that if canine blood had been transfused instead of human, the animal would have recovered.

X. *History.*—This experiment resembled the former, some slight differences excepted. Eight ounces of blood were drawn away from the femoral artery, and six of human blood were injected in their stead. The blood was thrown in without hurry, as fast as it flowed from the arm, in quantities of half an ounce, without being permitted to lie in the cup; but in consequence of the hasty and careless manner in which the apparatus had been put together, a few bubbles of air got into the veins. See Experiment V.

Symptoms.—Apparent death was produced by the bleeding; but as soon as the human blood was thrown in, the animal revived, and the blood, beginning again to circulate, flowed, though feebly, from the femoral artery; in the course of a few minutes, however, the same symptoms occurred as had preceded the death of the former dog: the animal gasped, yawned convulsively, and vomited; and after lying about an hour upon its side in a state apparently approaching to fainting, it expired.

Observations.—The general course of this experiment resembles that of the former; and it may be observed, that the small quantities of air which entered the vessels were not sufficient to occasion death. The proof of this assertion is derived from experiments which will be presently related, and from the event of the Vth, in which a similar accident occurred.

XI. *History.*—In this experiment, four ounces of blood were drawn from the femoral artery, and three of human blood were injected by the vein, in quantities of half an ounce at a time.

Symptoms.—The bleeding produced the usual symptoms, but the apparent death was not so complete as in the preceding experiments; it may be observed, however, that the revival after the injection was more perfect, as the animal did not vomit, and was able to walk, though unstably. Two hours af-

ter the injection there was thirst, languor, and debility; and the pulse was so small and weak, that it could not be distinctly ascertained whether it intermitted or not. These symptoms, however, gradually subsided, and on the *third* day it appeared to be rapidly recovering, but drooping a second time one or two days afterwards, it died on the sixth with a dropsy of the pericardium. An ounce of fluid had accumulated in this membrane, but there were no signs of inflammation, nor was there dropsy of the other cavities.

Observation.—This dog was very small, but healthy and lively.

If we may rely on these experiments, the human blood cannot be safely substituted, *in large quantities*, for that of the dog. It is certain that death was not produced accidentally, from the hurry of injection, or from plethora, from suffering the blood to lie in the cup of the syringe, or the dog to continue too long in a state of apparent death before the injection was performed, for all these accidents were carefully obviated.

Experiments on the Transfusion of the venous, instead of the arterial blood.

XII. These experiments were conducted in the same manner as those in which arterial blood was injected, but as the blood flowed rather sluggishly from the femoral vein, the injection was slowly performed. The dogs recovered.

Experiments on the injection of air into the veins.

XIII. *History.*—In this experiment five drachms of air were injected into the femoral vein of a dog, in quantities of a drachm at a time, and at intervals of thirty or forty seconds. The quantity of the air was measured by means of the syringe.

Symptoms.—During this operation, slight difficulty of breathing was produced, and the dog sighed deeply; the pulse, too, became unequal and the muscular system tremulous. As soon, however, as the animal was liberated, it leaped from the table, licked its wound, and seemed pleased with caresses. On the following day it was languid and restless, and the muscular tremors continued; the pulse intermitted occasionally, and the dog vomited once. In other respects it appeared tolerably

well, took food greedily, and revived completely by the third day.

Observations.—The dog which was made the subject of this experiment, was scarcely larger in the body than a full-sized cat, and very delicate. Its size considered, the quantity of the air which was injected is large; yet all the symptoms may be imputed, in part at least, to the alarm which the operation excited. The effects of these agitations seem sometimes to continue for hours, if the impression is strong, especially in dogs which are naturally timid, as this was.

XIV. *History.*—About three drachms of air were blown from my own lungs into the femoral vein of the dog; the greater part of it was introduced at once.

Symptoms.—The respiration and circulation were not materially affected, and the dog suffered so little, that a day or two afterwards it was led into the country.

Observations.—This experiment was made on the same dog as the former, and in the same manner; but the air which was injected had previously passed through the lungs, and three drachms were thrown in instead of five. The animal was less alarmed than in the preceding experiment, and hence, perhaps, in part the mildness of the symptoms.

From the two preceding experiments it seems that air, whether atmospherical or from the lungs, may be injected into the veins of the dog, and this too in considerable quantity, without fatally deranging the functions.

Experiments on the time required for the coagulation of canine blood.

XV. Three drachms of blood, taken from the femoral artery of a dog, and collected in the bottom of a conical wine-glass, began to coagulate in about ten seconds; were wholly coagulated in about eighty. In a second experiment the blood began to coagulate in about ten seconds; and was wholly coagulated in sixty.

The blood of the dog, therefore, coagulates more rapidly than the human.

N. B. As these experiments were designed merely to establish the general truth, they were not made with nicety.

Some observations on the cure of Hydrocele of the Tunica Vaginalis Testis, without procuring an obliteration of the Sac.

By KINDER WOOD, Esq. Member of the Royal College o Surgeons, and Surgeon in Oldham.

[From the Medico-Chirurgical Transactions. Volume IX.—Part I.]

I AM desirous of offering the following cases of Hydrocele of the Tunica Vaginalis Testis to the Society, because the cures were remarkably easy and expeditious to the patient, and effected by a slight extension of the palliative operation or simple puncture; and also because this successful result was procured without inducing an adhesion of the tunics and obliteration of the cavity of the sac. I trust there are many cases where the same operation will be equally successful, and I have therefore taken the liberty of adding such remarks as a consideration of the subject has suggested, which I hope will not be deemed too tedious an intrusion upon the time of the Society.

CASE I.

I was desired to examine a tumour of the scrotum, by a man who had been affected with the disease sixteen years. It had appeared after an injury of the parts, and had always been thought a rupture. He was of an healthy and robust habit, fifty years of age. I found the disease to be a Hydrocele of the Tunica Vaginalis Testis of the left side. The tumour was opened with a broad shouldered lancet, in the customary situation, the lancet in consequence of its figure making a larger incision into the external covering than into the Tunica Vaginalis; fourteen ounces of clear water were evacuated through the opening; when the Tunica Vaginalis was emptied of its contents, and a small part presenting at the internal opening, this was slightly hooked with a small dissecting hook, and a portion so brought forward through the internal incision, as to enable me to cut it away with a pair of fine scissors. The puncture was then closed and supported with adhesive plaister; the parts were put into a bag truss, and the patient enjoined rest and a recumbent position. The day after the evacuation

the patient was walking about the house upon my visit; there was a little tenderness and tension of the scrotum upon examining, but no pain in the loins nor fever. The third day the scrotum was much the same; the plaisters were removed and fresh ones applied, as they did not lie comfortably. On the fourth and fifth day the man walked up to my house, and from this time the tenderness and tension of the parts gradually subsided; the incision healed in an ordinary time by the first intention, and the result was a complete cure in less than a fortnight, so that the man returned to his customary employment.

In this case it is evident, that the consequence of removing a small portion of the Tunica Vaginalis Testis, was only a gentle and favourable inflammation of that membrane, the mildness of which was doubtless to be attributed to the endeavour of healing the external opening by the first intention. I have frequent opportunities of seeing this patient, and as the inflammation was so very mild, it always appeared to me that the cure was effected without any obliteration of the cavity of the sac. On the 20th of July, 1817, I examined the part, several years after the operation; it was rather fuller than the opposite side of the scrotum, but perfectly cured, and the testicle manifestly unconnected with the Tunica Vaginalis.

Case II.

I opened a Hydrocele of an elderly healthy man, which had appeared without any ascribable cause six months previous; eight ounces of a clear transparent fluid were evacuated, a small portion of the Tunica Vaginalis Testis was cut away, as before stated, and the external opening healed by the first intention in little more than a week. On the second day the scrotum was tender, and a little enlarged, which gradually subsided from the fifth day without the use of any external or internal means, except being supported in a bag truss. No effusion has since taken place. I lately examined the part, and could find no trace of the existence of a previous disease, except the remains of the puncture, which was very slight and scarcely perceptible; and as several years have elapsed, there can be no expectation of a return of the affection. But my attention was chiefly turned to an examination of the natural

connections of the parts, with a view of confirming my notes of the case; and I can have no hesitation in asserting, that no union has taken place betwixt the Tunica Vaginalis and the Tunica Albuginea Testis.

Case III.

Mr. R. consulted me about an enlargement of the left side of the scrotum; four years previously he had hurt the part against the saddle when hunting. The enlargement commenced in a short time afterwards: it was not very large; attended with numbness of the thigh and sense of weight in the loins; it was of a pyramidal shape and transparent. The disease being evidently Hydrocele, a puncture was proposed, to which the patient was extremely averse; the disease however enlarged, and he submitted. About five ounces of water were evacuated through a puncture with a broad shouldered lancet, a portion of the Tunica Vaginalis was brought forward and cut away with scissors; the external opening was accurately closed, held together with adhesive plaister, and supported in a bag truss; in the afternoon the patient walked about his house, giving directions to some workmen without any inconvenience. Upon the second day I visited him, and found that he regularly walked about his house and garden, without sustaining any particular inconvenience, having kept the part supported. The scrotum was slightly tumefied and rather tender to the touch, but there was no pain in the loins or fever. On the fourth day he walked to my house about a mile; the plaister was removed and another applied; the scrotum was still rather full and tender, but these symptoms gradually subsided, and in less than a fortnight the part was quite well. In this case also, the cure was completed without an abolition of the cavity, and a sufficient time has elapsed to decide upon its certainty.

It is easy by careful examination to ascertain, whether or not the cure of Hydrocele has taken place without abolishing the cavity of the sac. Upon the day I examined the scrotum in the second case, I also examined a scrotum where cure was effected by the abolition of the cavity. In this latter case the testicle was rather harder, larger, and less moveable beneath the external; covering and this may be expected, since the union of the two tunics necessarily diminishes the mobility of

this organ, and gives a sensation as if the testicle rolled immediately under the scrotum, having no greater space of motion than is allowed by the looseness of the cellular membrane. The contrary is the case when the cure is completed without obliterating the cavity, the testicle retaining all that looseness and mobility which it possesses in a state of nature.

In these cases no such effusion took place as that recorded by Mr. Ramsden, as immediately succeeding the quantity of stimulus he gave to the inner surface of the sac; the effect of cutting away a small portion of the Tunica Vaginalis, and healing the opening in the scrotum by the first intention, is evidently inflammation of that membrane, unaccompanied by any effusion of fluid, or inflammation of the testicle: in the three cases above related, the inflammation was also unusually mild, and not succeeded by any obliteration of the sac.

There is not any opinion in the practice of surgery, which has had so unlimited an acquiescence, as that the cure of Hydrocele requires a complete obliteration of the cavity containing the fluid. Douglas first seems to have had some doubts upon this, but rather insinuates than affirms the doubt, by considering an union as very improbable in those cases where the sac is old, thick, and indurated. From the universality of this opinion it has necessarily followed, that all operations proposed for the radical cure, are founded upon a presumption of the necessity of this obliteration; the cases of Mr. Ramsden, however, prove that this is matter of assumption only, and not of fact, and there are other observations which show how unfounded has been the opinion which has had so unanimous a concurrence. When Hydrocele is dispersed by the use of discutient applications, which has happened occasionally in adults, and which I have frequently seen in children; and when the fluid is absorbed from other causes, of which Mr. Pott gives two cases, undoubtedly the cavity of the Tunica Vaginalis Testis undergoes no process of abolition: but what has most frequently happened, and the process of which has excited little inquiry, is that recovery which occasionally succeeds to simple puncture and the evacuation of the fluid.

Mr. Elsa was of opinion that the simple puncture was more successful formerly than at present, owing to the puncture being

made larger; if this were really the case, it would be desirable to return to such a practice; for to cure by one mild operation, is better than to cure by two mild operations; and it is laid down by Sir James Earle in his excellent work, that previous to attempting a radical cure, the palliative operation should always be performed once. But the cause of cure after puncture will not be found in the size of the incision. Mr. Pott, to whom this operation is under so great obligation, has pointed out the cause of cure, though I think he has not drawn such an inference as the premises warrant. "If the opening in the Tunica Vaginalis was small and united again immediately, the bag always filled again with water, and the disease recurred." So says that admirable writer: and again he remarks, "If the orifice instead of immediately uniting became inflamed or sloughy, such an adhesion of the coat to the albuginea testis sometimes followed, as caused an abolition of the cavity, and consequently a radical cure." Warner has a case very much in point: a puncture was made with a lancet, and a tent introduced through the opening; a discharge came on on the fourth day, followed by an abscess, which being opened healed in a few days. I presume that such a rapid healing of the abscess could not possibly have taken place, had there been any collection within the cavity of the Tunica Vaginalis Testis; such a collection of pus healing thus could only have been situated in the cellular membrane of the scrotum. What then is the inference we would draw, but that when the opening heals by the first intention, we fail in producing a cure; and that when the opening does not heal by the first intention, a cure very frequently follows, not indeed in the greater part of cases by the abolition of the cavity, but because the inflammation of the sac thus excited rouses and stimulates the exhalant vessels to a more vigorous and healthy action, thus overcoming that relaxed and atonic state of them which is the cause of the accumulation.

Whatever may be the remote causes of Hydrocele, the proximate cause will not be found in diminished action of the absorbent vessels; of this Sir James Earle's 25th Case is a proof: a small incision was made into a Hydrocele immediately after a bruise, when a fluid, of which the major part was

blood, issued out; the bag was not emptied, but closed and healed. A short time after the tumour was again opened, and the fluid discharged was of a pellucid straw colour. Upon this case the author remarks, that the absorbents on the surface of the membranes appear to have had the power of separating the red globules and absorbing them; whether this follows as a consequence I do not inquire; enough is proved for the present purpose, that the absorbents, so far from being tardy or inert in their functions, were in a state of considerable activity; and we are reduced to explain the phenomena of the disease upon the grounds of an increased secretion only. Whether the accumulation of the fluid be the consequence of an increased activity of the vessels, as is Mr. Ramsden's opinion, or of a relaxed and debilitated state of them, may be difficult to decide; but from the total absence of all symptoms denoting increased action, and since a cure does frequently follow the application of a stimulus to the sac, it would appear that the proximate cause of the effusion consists in a relaxed and debilitated state of the exhalant vessels of the part.

If these opinions are correct, it would appear, that a stimulus to the vessels of the part, and not an union of the two membranes, is the natural cure; for who would prefer abolishing a cavity which doubtless has its uses, so far as regards the functions of the testicle, rather than to effect a cure by stimulating diseased vessels to a sound healthy action. The inducing a certain degree of inflammation, has the effect of stimulating these vessels and superseding the diseased state of them, as Mr. Ramsden's cases prove. Nor is the part singular in this respect: many chronic affections are cured by increasing the actions of the vessels, particularly that chronic ophthalmia which consists in relaxation and debility of the blood-vessels of the albuginea of the eye. What then have we to do, but to stimulate and excite these vessels in the most easy and the most natural manner?

It is well known, that when a puncture is made into circumscribed cavities, if union by the first intention does not take place, the consequence is an extension of inflammation from the puncture along the membrane lining the cavity; such takes place with an amazing rapidity in cases of puncture of the pe-

ritoneum, pleura, and in the membranes lining the large joints; and such an inflammation also takes place in the membranous bag containing the water of Hydrocele under the same circumstances. It is this inflammation ensuing upon a want of union, which is the most frequent cause of the cure of this disease, when such cure takes place after the simple puncture. Undoubtedly, in some cases where the Tunica Vaginalis and the Albuginea Testis are very much irritated during the evacuation, either by too much handling or other circumstances, these tender and delicate membranes will inflame too highly, and suppurate or slough, and thus produce a cure of which there are many cases in authors; but in the majority of cases of cure under these circumstances, it is effected as in the cases related in the commencement of this paper, by a slight and mild inflammation of the Tunica Vaginalis Testis alone. The object then will become that of preventing the opening in the Tunica Vaginalis from healing by the first intention, and also to do this in such a manner as to avoid the danger of suppuration and sloughing; for this purpose, since it is adviseable that the palliative operation should always be performed once previous to attempting the usual means for a radical cure, I would recommend a slight extension of it as in the cases above related, viz. to bring gently forward by means of a small hook that portion of the Tunica Vaginalis presenting at the external opening, and to cut away the portion thus hooked with a pair of scissors, afterwards closing the external opening with adhesive plaister. By which means a moderate inflammation of the membrane will be ensured, and I am led to hope the success will be frequent.

In the three cases related, the sac was not much thickened; a material circumstance to notice, because in old and very large Hydroceles, and where the sac is much thickened and indurated, a stimulus much greater than the means here proposed will produce is required; and hence it will be necessary to guard against disappointment, by putting the proposed plan in execution only where there is a probability of success, which is in moderate sized cases, not too old, and where the sac is not too much thickened and indurated.

The following case is subjoined, because the plan was put

in execution under the most unfavourable circumstances of bad health; and it shows that although the symptoms ran high, they were not so troublesome as those which would have succeeded any other operation, nor indeed does it appear that any other mode would in this case have been admissible at all.

A man about forty-five years of age had been under my care some time for affections of the chest, attended with cough, large mucous expectoration and dyspnœa; his countenance was very sallow; he was low-spirited, and could not sit much up, when he showed me a Hydrocele of the left side of the scrotum. As I was very averse to the making an opening, he was advised to suspend the part and wait patiently. Understanding, however, that the collection was watery, he became resolute to have it discharged, and in compliance with his earnest request more than my own inclination, a puncture was made with a lancet; betwixt ℥iij and ℥iv of straw-coloured fluid evacuated, and a small portion of the Tunica Vaginalis cut away. This was succeeded by an inflammation of the substance of the testicle itself: he was advised to support the part and keep a recumbent position, which he did for three weeks; the inflammation of the testicle was very violent and painful during its continuance, and yielded slowly to the ordinary treatment. After the pain was gone, it continued obstinately enlarged and hard many months, so as to require a constant suspension. In this state he returned to his customary occupation, and the tumefaction gradually subsided. During the confinement, and the violence of the affection of the testicle, the irritation of the chest gradually subsided and disappeared, and I was very much induced from its previous obstinacy to conclude, that this affection of the testicle had a powerful effect in superseding the troublesome and formidable disease in the breast. In the beginning of August, eighteen months after the puncture, I examined the testicle, and found it a little larger than the opposite one, but no other perceptible difference from nature, excepting an evident adhesion of the Tunica Vaginalis to the Tunica Albuginea.

Observations on the Sickness which prevailed at Jessore, (Bengal), in the Months of A g. and Sept. 1817. By ROBERT TYTLER, M. D. Assistant Surgeon, Civil Station, Zilla, Jessore.

[From the Medico-Chirurgical Journal for October, 1818.]

THE situation allotted for the station, comprehending a few brick-built, scattered houses, chiefly lower-roomed, or consisting of one story, but well elevated and flued, and inhabited by the Europeans, is a flat spot of ground, intersected with ditches, and containing much jungle, along with indigo and paddy fields, reaching close upon the premises surrounding the habitations. On the north side is an inconsiderable branch of the Ganges, having little communication with the parent river, and which, except in the rainy season, is almost stagnant. On the *northern* side of this, opposite to the town, a broad space of low and sunk ground is left uncovered, and, during the wet months, converted into a stagnant offensive marsh. Along the *southern* bank the BAZAR runs in a continued line for a space of more than two miles, consisting of narrow and damp streets, lined with huts, crowded upon each other, and containing, for sale, various putrescent articles of food, emitting disagreeable and noxious effluvia. The walls of these huts are constructed of bamboos and straw. They are perforated by very narrow windows, have but one small door, and consequently free ventilation of atmospheric air never takes place within their dismal interiors.

From the end of January, much rain fell, which is rather an unusual occurrence in Bengal; in consequence of which the lower grounds were, in several places, inundated, and by the solar heat a considerable extrication of miasmata succeeded, and some mortality prevailed, but not to any great extent.

On the 19th of August, when the prevalence of a general disease was expected, a case of severe illness was reported to me by a native doctor. I found a middle-aged man in a state of great prostration of strength, surrounded by his friends, who were pouring water into his mouth. The preceding day he was in perfect health. In the night, he had been seized

with violent abdominal pains, repeated vomiting, frequent discharges from the bowels, and incessant thirst. The symptoms in the present case were precisely the same with those since ascertained to mark this peculiar disorder. The face exhibited a livid paleness (indicative of great corporeal distress in a native); the eyes were hollow; the eyelids half closed; the forehead bedewed with cold perspiration; the extremities and surface of the body frigid; no vestige of pulse at the wrists or temples.* He died the next day; and it was now ascertained that seventeen had perished in the same manner during the two or three preceding days.

The rapid progress of the disorder now produced universal alarm among the natives; and I find, by my notes, that on the 21st of August fifteen men died in the Bazar, all affected with the same symptoms; viz. violent gripings, vomiting, and purging, which, if not relieved soon, generally terminated fatally in a few hours.

As the usual modes of treatment employed in cholera morbus afforded little prospect of benefit, I ventured to have recourse to calomel and opium; and the success of the practice exceeded all expectation, especially when exhibited early, and before the constitution became so enervated, that no hope existed of recalling the flitting spark of life.

In order to obviate this nervous depression, I resolved to administer a volatile antispasmodic mixture, containing two ounces of æther, the same quantity of spirits of ammonia, and a quart of water. This mixture proved of the greatest benefit. These were the only remedies employed by myself, and under my own directions by the native assistants in the town of Cushbah, its vicinity, and the jail; and, notwithstanding the hurry and confusion consequent on so extended an epidemic, the number rescued from the jaws of death, by these means, considerably exceeds two hundred, most of whom are now living at Jessore.

The method of treatment was this. Eight grains of calomel

* Dr. Tytler here, and throughout the paper, labours to trace the cause of this epidemic to damaged rice; but the reasonings are so bad, and the facts so dubious, that we entirely omit them. The causes of this epidemic will be more rationally accounted for in the succeeding paper, by Mr. Evans. *Editor of the Med. Chir. Journal.*

were invariably administered at the first visit, followed by the opium in doses of a grain, and the antispasmodic mixture, as the reduction of the pulse, and frigid feel of the skin, indicated its exhibition, and the continuance of the calomel at intervals, in doses of four grains till the virulence of the symptoms was subdued. In some cases, the calomel was taken to the amount of 30 grains, in the course of twenty-four hours; the opium to four grains in the same time; and the mixture, containing the ammonia and æther, eight ounces. But in general, upon swallowing the dose of calomel, the vomiting ceased, and the patients were relieved.

Pathology. Only one dissection could be procured—a convict in the jail. The mucous membrane of the stomach and bowels was inflamed.

The following observations on this Epidemic, as it appeared in Calcutta and the neighbourhood, were obligingly communicated by Mr. William Evans, who was an eye-witness.

"The year 1817 was uncommonly irregular. The rains set in about the middle of February, and continued till the night of the 17th of October, concluding with a heavy fall. The thermometer, during all this wet season, ranged from 85 to 98°. The whole country became inundated, was one vast swamp, and sent forth the most pestilential miasmata. The number of natives who fell victims to this disease at Calcutta was almost incalculable. Several hundred bodies were burnt every night at some of the Ghauts leading from Chitpore road to the Hoogly, and the ashes thrown into the river. There were full as many thrown into the water, for want of sufficient fuel to burn them. The floating corses at length became so numerous, and so entangled among the cables of the shipping, that the stench was unbearable, and the magistrates were forced to employ Mussulmen to clear the bodies away.

"The environs of Calcutta exhibited, towards the latter end of October, the most appalling scenes of distress. Most of the palankeen bearers and coolies fled to the country in hopes of escaping the sickness; and by crowding into obscure villages, spread the epidemic in all directions. But few of the Europeans suffered, evidently owing to their more comfortable lodgings, and superior salubrity of food, clothing, &c.

"About the 20th of October the monsoon changed to the north-east, with a cold piercing wind; the ground still wet. The disease now quickly changed its type from cholera to dysentery, which became milder and milder to the end of November, when it ceased altogether. At this time the country was dry.

"During August and September, cases of fever were not unfrequent, and several Europeans were cut off in a few hours by the violence of the disease. At Calcutta the attack frequently came on instantaneously, with large frothy stools; vomiting of limpid fluid, sometimes mixed with bile; great prostration of strength; distortion of countenance, which changed from black to a deep lead colour. The eyes were sunk and their lustre lost; immediately on the accession of the disease, the pupil became dilated, and appeared as though the patient were dead. I have seen them fall down in the streets, faint, and often die forthwith!

"The opium and calomel pills, as recommended by Dr. Tytler, were used at Calcutta, and certainly with benefit. I found it better to give the tincture of opium with calomel in a jelly, and some warm aromatic cordial immediately afterwards. But the '*Drogue Mere*,' of which I send you the recipe, was the most beneficial of all remedies, and had an immense sale latterly. The vender and preparer was an old Spanish Padre (Dr. Minguet), with whom I was intimate, and who kindly furnished me with a specimen of the plant herewith transmitted. The dose of the medicine was a small wine glass full occasionally.

"FORMU A.

"R.	Aloes - - - - - - -	Oiij;
	Myrrhæ - - - - - -	Oij;
	Gum. Olibani - - - -	Oj;
	Croci - - - - - -	ʒiv;
	Herbæ justiciæ paniculatæ	Oj;
	Aquæ vitæ - - - - -	OL.
	Ft. infusio.	

"WILLIAM EVANS.

"*London, July*, 1818."

Some Remarks on the Climate and Situation of Nice, with Observations on the Temperature and Weather taken in the Winter of 1816 *and Spring of* 1817. By a Correspondent.

[From the Annals of Philosophy, for September 1818.]

(To Dr. Thomson.)

London, 1818.

SIR,

DURING a residence of some months last year at Nice, in a climate so superior to our own, it was an object of some interest to myself and party to make daily observations on the weather and temperature, with a view of comparing them with those which we received from time to time from our friends in England. Since my return home I thought it might be an object of sufficient utility, in some respects, to be worthy of a little time and trouble, to put my observations into some kind of order, by arranging those of the temperature taken at Nice and in England* together on a common synoptical scale, by which a comparison could be more readily made between the two climates in respect of the changeableness and difference of temperature. I regret much that I was not furnished with a barometer, that I might have added observations with that instrument also into my table.

The latitude of Nice is about 43½ degrees north, or eight degrees south of London, and 7¼ degrees east of the same. The city, with its suburbs, is situated in, or rather surrounded by a rich plain, which may be about a mile and a half from east to west, and about two miles from north to the sea shore; it is bounded by a range of hills, which, beginning to the south east at the distance of about a quarter of a mile from the town, are continued as far round as the south west of various forms and gradations; and, like the successive benches in an amphitheatre, rise one above another until the snowy chain of the maritime Alps, about 8,000 or 10,000 feet high, appears like the boundary wall to the whole at a distance of about 25 or 30 miles. The

* The observations of the temperature in England which I have used in my scale are those of Luke Howard, as published in the *Annals*.

city is situated near the shore, which immediately faces the south; and the river Paglion, which takes its rise among the neighbouring mountains, after flowing through the plain, enters the sea near the city walls. The sea is remarkable for the beautiful blue colour it generally exhibits, probably arising partly from the absence of tides, by which its waters, being so little disturbed, become highly transparent. After rain, however, the limestone washings from the neighbouring mountains tinge its waters to a considerable distance off the mouths of the rivers, which sometimes have a curious appearance. The deep blue colour of this sea may also be owing to its depth, which is very considerable off this coast; according to the measurement of Saussure, taken about half a league off the Cape, between the ports of Nice and Villefranche, the depth was found to be 1,800 feet; it might also be observed by the great length of line used by the coral fishers who ply off this shore. Although little or no tide is perceptible in this sea, a southerly wind, or the approach of one, raises the ordinary level of the water some feet more or less upon this shore, and sometimes produces a very considerable surf. The sea breezes usually prevailed from about nine or ten, A. M. to four or five o'clock in the afternoon; and that was generally the case even when the upper current of wind came in quite a different direction. I remarked on one excursion to the summit of Mont Coa, about four miles north of Nice, that the sea breeze, which was felt so pleasant in the valley, did not prevail at that elevated station, about 2,000 feet. I occasionally observed, by the motion of the clouds, that the mistrale, or bise, (a north east wind so well known in Provence)* was passing over our heads, whilst the mild breeze from the sea was blowing upon us.

* This wind (styled one of "les fléaux de la Provence"), by which this part of France is so much visited, after passing over the High Alps and their immense snows and glaciers, takes its course with increasing violence towards the warm atmosphere of the Mediterranean; it is particularly violent in the valley of the Rhone. A friend of mine travelling from Avignon northward up this valley, while this wind was blowing with its usual fierceness, informed me that he did not appear to get clear of it until he had passed Lyons, although I found it still to prevail at Marseilles and Toulon for some days after. It is piercingly cold and dry, at the same time that it is violent, and in its course blows up the sand about the rivers and the limestone dust off the roads in

The sirocco, or south east wind, sometimes came on about sun-set in a brisk breeze, but at the same time with a mildness which at first quite surprised me; it was by no means relaxing, but very agreeable to the feelings; it generally ceased in the course of the night. The southerly winds sometimes blew with very sudden and rather violent squalls, which, however, commonly subsided in an hour or two.

The clearness of the atmosphere was very remarkable; the moon and the stars appeared very brilliant, and the lofty mountains of Corsica, with their snowy summits, were occasionally to be seen by the naked eye rising above the south eastern horizon at a direct distance of about 120 or 130 miles, (English); their forms were most remarkable a few minutes before sun-rise, sometimes presenting very perpendicular sides, and often varying greatly in their apparent outline from day to day. This mountainous island very rarely appeared unattended by clouds even on clear, bright days; their forms, I remarked, were generally *Cumuli* (owing no doubt to the coldness of the atmosphere over the snows of those mountains); these *Cumuli* about sun-set sometimes presented a grand and richly coloured mass towering above the horizon to an immense elevation, reflecting the sun's rays for some time after the sun had gone down.

The clouds which appeared in the field of our observation sometimes afforded much interest in a meteorological point of view. From the concave and sheltered situation of the plain of Nice, so directly exposed to the south, the temperature of the surface of this plain, as well as of the superincumbent atmosphere, is rendered more or less considerable, especially as the sun gets up towards the meridian. The temperature of the lower stratum of air being increased, and consequently rarefied,

vast clouds over the country, which is particularly the case about Marseilles, where on those roads there is so much traffic. It lasts in general several days, increasing in velocity and coldness as it seemed almost every hour. ("*Laissez-la*," said a native to me, with a significant shake of his head, in reply to my observation as this wind was coming on, that it was not so fierce as I was given to expect; and I had afterwards to remember his answer.) It is felt generally throughout Provence, particularly at Marseilles, and at Avignon, Montpelier, &c.

it is evident that the upper region of the atmosphere above us would also receive an increase of temperature, by the constant succession or supply of warmer air from the region below, which again (as it appeared) received its supply of cool air from the most open quarter, viz. from the sea. This sea breeze, as I have stated above, generally came on about nine or ten o'clock in the morning, by which time the sun was sufficiently elevated that its rays could bear upon the whole plain and sides of the hills with effect; the breeze generally increased till about two o'clock; and about sun-set subsided. This circulation, or ascending current of the warmer air, seemed to have at times considerable effect upon the clouds which happened to pass in our zenith, and which were not too elevated to be out of its influence. I have observed several instances of the atmosphere in the morning being quite overcast with clouds, and apparently (to an English eye) threatening rain, but which, about noon, became quite fine and clear; and in the afternoon the clouds, to my surprise, almost, and even wholly, to disappear (and this was not an uncommon occurrence). It was rare indeed during my stay there, that the sun was not to be seen and *felt* also in the middle of the day. In one instance a north westerly current brought up a quantity of clouds in detached *Cumuli*, which, when they had reached our zenith, were met by the sea breeze from S. E. which carried them all back, and in a short time disappeared. At other times they advanced to the summits of the neighbouring mountains, where they rested for the greater part of the day, assuming the *Cirrostratus* form. Thunder storms, I was informed, occurred very frequently in the summer, two or three times in the course of a week in the neighbourhood of the mountains, but that they seldom visited Nice (except at times during the spring). I had an opportunity of remarking this on the approach of a storm, one morning in the beginning of the summer.*

* Extract from daily observations respecting this on June 2:—"Fine day: observed some finely illuminated *Cumuli*, with dark *Cirri*, traversing their sides, rising up above the mountains to the north: as they rose to a certain elevation, their summits gave way, and spread, as if acted upon by a different state of electricity, into a *Cirri* form; at length, about noon, several collected in the north into a dark, heavy mass of thunder clouds, discharging

In this fine *Italian* sky, if so it may be called, the clouds, as a variety, often added much to the picturesque appearance of the landscape; it is not often, perhaps, that scenes are met with so beautiful and so highly picturesque of the kind as the north-east view of the town and rock of Nice, with the distant shores of France over the Bay of Antibes, about sun-set, and the reverse view, viz. from the ramparts of Antibes, of Nice, with the mountains that rise behind it in successive ranges, and the snows of the Col de Tende, &c. bounding the picture.

The mildness of this climate, and the sheltered situation of the country about Nice, render it a fine field for the lover of botany to follow his favourite pursuit, a subject which I regretted I knew so little about. It was, however, interesting to attend to the geography of plants, which the gradual elevation of ground from the shore to the summits of the mountains rendered very remarkable, particularly in some species.

On the fertile plain of Nice flourished the orange and lemon trees in gardens (of which there were above 60 different kinds);* also the date palm (Phœnix dactylifera,) the pomegranate (Punica Granatum,) the Nerium Oleander, the cypress, different kinds of geraniums, the sweet-scented Verbena, the myrtle, one of the Gossypiums, or cotton tree, the olive, the white mulberry (Morus Alba,) which supply the silk worms, and many other trees and plants; and on the walls and rocks in warm situations, the Cactus opuntia, or Indian fig,

rain or hail over the mountains; the mass gradually approached our zenith although the wind with us was blowing in a direction contrary to it; but before it reached our zenith, it seemed to have fallen into a different atmospheric medium, and I observed it soon began to fold itself backward, and in an hour or two the whole seemed to be gone, or merely to leave behind some light *Cirri*."

* In a small publication, by Risso of Nice, of the different kinds of orange, lemon, and lime trees cultivated in the Dep. des Alpes Maritimes, he divides them as follows:

Species of the Orange (Orangers) - - - - - -	19
——————Bitter ditto (Bigaradiers) - - -	11
——————Limetiers (Limes) - - - - - -	7
——————Cedratiers (Cedrat) - - - - - -	3
——————Limoniers (Lemon) - - - - - -	25
	65

the caper shrub (Capparis Spinosa), the great aloe (Agave Americana), to be seen in some places ornamented with its stately flower 20 or 24 feet high. On ascending the hills a few hundred feet, but few of these were to be seen; the orange tree soon disappears; its region is very limited in distance from, and elevation above, the sea; with respect to the former two myriametres (about 11½ miles) has been stated by Risso to be its limit. The olive region may be traced considerably higher up the hills, higher on their south sides than on the north; this region, as near as I can guess, does not much exceed in general 800 or 1,000 feet in elevation; its distance from the Mediterranean I found, when travelling northward from Marseilles, to be about 70 or 80 miles; it dwindles away to a mere bush between Avignon and Pont d'Esprit, about which place I lost sight of it. Above the olive region generally appeared the Pinus Abies, the Pinus Sylvestris, or Scotch fir, Juniperus Communis, the chesnut (Castanea vesca), &c.; upon this region the snow in winter sometimes fell, and remained for a longer or shorter period, according to circumstances.

Some attention to the geography of plants is useful in choosing a situation most advantageous for an invalid whose case requires a warm climate; thus the olive and orange trees may serve as useful subjects in this respect for the south of France. About Aix and Nismes the olive is but a humble, lean-looking bush, or standard, from about four to 10 or 12 feet high, requiring the use of the pruning knife to bring it into condition for a crop every other year: at Marseilles it increases in stature, appearing as a small tree; at Nice it becomes a fine thick tree, about 20 or 30 feet in height, bearing annually, and apparently but seldom pruned; and about two miles to the east of Nice, near the town of Villefranche, a situation peculiarly sheltered and exposed to the south, this tree appears to great perfection, and affords an excellent, hard, and close-grained timber, which is a good deal worked by the cabinet-makers and carpenters at Nice. Again, the orange tree flourishes and brings its fruit to perfection in the plain of Nice (some few of them under shelter of Mont Cimiez I should guess were from 25 to 30 feet high); the fruit is still finer in flavour and earlier

matured at Villefranche; the tree is also well cultivated and in high perfection at Hyeres, though I understand that at Toulon, about nine miles only distant, it requires the shelter of a wall, and at Marseilles the shelter of a green house in winter. And even in the neighbourhood of Nice, it might in the same manner be observed, that some situations were much more eligible than others in point of shelter and warmth, though not so evident at first sight. After a visit by a very cold, bleak, and violent mistrale in the month called April, its mischievous effects were very observable upon the tender vine shoots as well as upon the young green leaves of the mulberry trees, in shrivelling them as if they had been burned, leaving but a poor prospect for the next vintage, and throwing back considerably the ensuing crop of silk. I observed these effects particularly between Antibes and the valley of the Var; also in many situations in the valleys about Nice, which ran north and south; but in other places on the south sides of the hills, the mulberry trees mostly escaped uninjured, and in some instances were to be seen in a flourishing state at a little distance from others which were blasted, but which had not been so protected. The most protected situation about Nice appeared to me to be the south side of Mont Cimiez, or the plain between it and the shore, which includes the *Croix de Marbre*, a quarter the most frequented by the English. Villefranche is undoubtedly a warmer and more sheltered spot, but it is a place not to be compared to Nice for accommodations, or even the necessaries of life, at which place the now frequent visits of our country-men for the benefit of the climate have afforded the inhabitants the opportunity of learning English wants and comforts. With respect to our consumptive patients visiting so distant a spot for the benefit of the climate, it appeared clear, that unless they decide to go there at such an early stage of the disease, when they are able to take the air and exercise which this fine climate allows of with so little interruption, the experiment would seldom prove successful. The journey itself, of 800 or 1,000 miles, although alleviated by a safe and easy water conveyance from Chalons to Avignon, is of itself a heavy, and it may be a painful toil to inflict upon the sufferer; yet the earlier the decision is made, the greater appears to be the probability

or certainty of success, or recovery. I hope I may be excused for thus deviating a little from the original subject of this communication; but I am led to do so by the hope of dropping a hint or two that might be at all useful to any concerned, or likely to be concerned, with the subject.

On Mental Alienation. (From the *Dictionnaire des Sciences Medicales.*)

[From the London Medical and Physical Journal, for December 1818.]

A natural reflection arises from the general consideration of the different modes of treatment that nave been adopted by the ancients and moderns: it is, that the idea of a pretended specific, at least if it be not founded on an extensive series of well-determined facts, leads on this subject, as in many others, to a blind empiricism and a continual vacillation of opinions. The ancients, although accurate observers, drew general conclusions from a too-confined number of particular facts; and, referring the seat of the disease to the digestive organs, they believed the only means to be employed, in all cases, were drastic purgatives. The greater number of moderns, on the contrary, have only regarded the alienation as a consequence of too great an afflux of blood to the head, and have merely advised a repetition of frequent blood-letting, and the application of cold water to the head. Other physicians have considered it as a purely nervous or spasmodic disease, and have had recourse to anodynes and sedatives exclusively. But a judicious application of the medical art, in a large assemblage of patients of this class, shows us that these are only modes of treatment relating to the different circumstances which have produced or encouraged the malady, and the individual constitution, age, &c. of the patient.

The manner of directing a hospital of lunatics, with respect to the rules of hygïene, is subjected to the general rules which are common to it with that for the general assemblage for infirmities; but there are some indications which are pecu-

liar to it, naturally arising from its particular application: as, in the first place, a spacious local residence divided into numerous apartments; a pure and salubrious air, that may be made to circulate freely through all the different cells; and sometimes a necessity for disinfecting them by means of fumigations of muriatic acid: the impression of cold air is dangerous in the decline of a paroxysm; the use of mucilaginous decoctions acidulated, or emulsions; during the state of agitation and violence of mania, or on its decline, the exhibition of gentle laxative medicines, alternately with a light bitter tonic infusion; in general, a substantial nourishment, but principally composed of vegetable substances; autumn and summer fruits are not less useful for maniacs than for melancholics; not to condemn to inaction any but the violent or dangerous maniac, and to permit him to use his limbs as soon as he is no longer extravagant, or the violence of the paroxysm has subsided. Does he become convalescent?—to apply him to some sort of occupation adapted to his inclination; to occupy women with needle-work, and the men with some mechanic labour, or gymnastic or rural exercise; and, in some cases, to favour certain natural secretions or excretions, according to the particular cause which has determined the production of the malady, or to produce some preternatural evacuation. The moral and physical treatment will also require to be modified according to the different periods of mania.

In the first period,—is the patient in a state of extreme agitation?—let him be confined in an obscure chamber, to avoid the impression of light, and all objects tending to produce excitement; and to indulge his inclination for cooling and acidulated drinks. He often, then, experiences at intervals a great voracity, when an abundant quantity of nourishment should be allowed him. When the violence of the paroxysm diminishes, and it will be no longer dangerous to himself or others, he may have the liberty to use exercise in a confined space, his motions being in some degree restrained by a strait-waistcoat. This is, then, merely a sort of *medecine expectante*, aided by a mild diet proportioned to the appetite; a careful superintendence of his actions, regularity of attendance on him, and a sort of harmony between all the objects conducive to health. I

revere the ancients, I admire their supreme sagacity in the art of observation; but I may also be allowed to be guided by the results of more than twenty years' experience on extensive assemblages of patients, which has led me to confine to certain particular cases the use of emeto-cathartics, hellebore, gratiola, sternutatories, repeated blood-letting, sudden immersion in cold water, so blindly and servilely adopted, without restriction, by some modern physicians.

On the decline of the disease, greater liberty of movements may be gradually permitted, and patients may be drawn from a state of fury and violence, by having recourse, at intervals, to a variety of gentle measures,—as, tepid baths two or three times a-week; the occasional use of laxative and acidulated drinks; gentle dashing of cold water on the head, and this only towards the end of the time at which they remain in the bath, and for a few minutes; all the resources of moral regimen; testimonies of kindness and affection; condescension to all his little whims, and a careful evasion of his indiscreet demands; acts of violence, or even offensive commands, should never be employed, but a regular, firm, imposing style of conduct, whenever the patient assumes an authoritative tone or becomes unruly.

The general views which have been displayed of the mode of treatment for lunatics, may be modified by the particular circumstances of the determining cause, the individual constitution, the mode of life, and the various complications of the malady. If it have been preceded by the repulsion of some cutaneous disease, or of gout, these disorders should be recalled to their original seat by irritative frictions, blisters, and setons, joining with these external means, antimonials, sudorifics, sulphureous waters, &c. Should the disorder appear during pregnancy, we must patiently wait for the termination of this state. Does it take place after childbirth?—constant experience teaches us the advantage to be derived from evacuants in the first instance, followed by the application of a vesicatory to the neck. A plethoric state of the system, or the suppression of some hæmorrhage, may render bleeding necessary, but not a frequent repetition of it, which may plunge the patient into a state of incurable folly; but local abstraction of blood by

leeches applied to the inferior extremities, sometimes to the anus, to the vulva, or to the head, according as a suppression of an hæmorrhoidal evacuation, a periodical flux, or the preludes of cerebral congestion, may have been remarked.

A lunatic subject to spasms, should be treated in some degree with anodynes and sedatives: a state of atony and stupor demands, on the contrary, the use of stimulants and tonics. We have previous indications for the mode of treatment when insanity is determined by a wound of the head, disappointed or rejected affections, a forced state of celibacy, difficult dentition, habitual insomnium, a state of extreme distress, &c. Is it not curious to see a physician seek his means of cure, in these cases, in pharmacy?—PINEL.

SELECTED REVIEWS.

*Memoir on the Membrana Pupillaris, and on the formation of the Arterial circle of the Iris. Read before the Royal Academy of Sciences, at their meeting, July 6th, 1818,** by JULIUS CLOQUET, M. D. late House Surgeon of the Civil Hospitals of Paris, Dissector to the Medical Faculty, Professor of Anatomy, Physiology and Surgery. 8vo. with a plate. Paris, Méquignon-Marvis.

[Translated for the Eclectic Repertory, from the Noveau Journal de Medecine of Paris, for August 1818.]

IT were desirable that anatomists should be particularly engaged in the study of certain points in the science, on which our information is imperfect, and often contradictory. How much remains to be ascertained respecting the internal structure of many organs; the uses, the functions, the nature of many others; the existence of some, as the exhalant vessels admitted by Bichat; the excretory ducts of the lachrymal gland, observed by a few certain vascular and nervous communications inferred to exist rather from reasoning than from ocular demonstration? The successive changes the organs undergo in their structure, are not these the proper objects of attention; may they not contribute to explain various physiological phenomena still enveloped in the most profound obscurity? It is with the view of filling up the void, and of fixing our ideas respecting the membrana pupillaris, that M. Juli-

* Eight days after this memoir was read to the Academy of Sciences, Doctor Portal read a note on the same subject. I am ignorant, states M. Cloquet, whether the facts it contains bear any analogy to those I have offered; I notice this circumstance, lest I should be charged with plagiarism if my opinions and those of the learned professor should be found to resemble each other. In the course of this memoir I shall advert to the opinions which are contained in Dr. Portal's printed works.

us Cloquet engaged in a variety of researches on the situation and structure of the membrane, on the phenomena of its rupture, &c. We shall merely give an analysis of the memoir, and notice the principal results which he observed, and which he quickly communicated to the Royal Academy of Sciences. This analysis we trust will excuse us from offering the commendations which the work of our colleague so justly merits.

The pupil, or aperture of the iris, which in the adult by its dilatation and contraction regulates the quantity of light which ought to enter the eye, is not fully developed in the fœtus, during a certain period of gestation. It is then closed by a very delicate membrane, which was discovered in 1738, by Wachendorf. This anatomist denominated it the membrana pupillaris. Albinus, who claimed this discovery, Haller who decided the question in favour of Wachendorf, Zinn, Rœderer, &c. have likewise mentioned this membranous production, but have not described it with sufficient accuracy. Sabatier merely notices it. Wrisberg and the preceding writers ascribe to it a vascular structure. Bichat and several others, on the contrary, assert that it is totally unprovided with vessels; moreover, some authors of no less celebrity have doubted its existence.

M. Cloquet has uniformly found the membrana pupillaris in the human fœtus, usually about the seventh month, after which period it disappears; sometimes it is even ruptured at the sixth, it is seldom found entire at the eighth. Only on one occasion did he discover it in a full grown fœtus, and then it was broken in the middle.

While the membrana pupillaris is entire, it forms with the iris a complete partition which separates the two chambers of the eye and prevents any communication between them. Like the iris it is flat, and appears more tense, as it approaches the period of its rupture. It is fixed to the whole circumference of the pupil and extends itself particularly on the anterior surface of the iris. It presents no opening in its natural state; in front it is directed towards the anterior chamber; behind, to the posterior chamber and to the crystalline lens.

The membrana pupillaris is transparent and colourless. Wachendorf had observed that it had a grey or blackish tint

more or less intense. M. Cloquet discovered that this colour was not inherent, but was owing to a portion of the pigmentum nigrum of the posterior surface of the iris, dissolved in the fluid of the posterior chamber by an incipient putrefaction. This pigment, dissolved in the aqueous humour, colours all the parts it comes in contact with. Wrisberg, who examined a great number of membranæ pupillares, never remarked this colouring.

The membrana pupillaris is supplied with blood vessels, visible by the naked eye. Its tenacity is such, that it is broken by the slightest force, and the greatest care is required to preserve it entire. In the fœtus of three or four months, it is flaccid, white, as it were plaited, and the vessels are not well defined. The existence of the membrana pupillaris cannot be discovered before the end of the third, or the beginning of the fourth month. Antecedent to this, the eye is so soft, that it is impossible to prepare it. At the fifth month, the vessels are conspicuous, and its existence unequivocal.

Organization. The membrana pupillaris is evidently composed of two laminæ, very thin, diaphanous, and in close contact. The posterior one belongs to the corresponding chamber of the eye, and arises from the edge of the pupil. The anterior is a continuation of the membrane of the aqueous humour, lining the posterior surface of the transparent cornea to which it is intimately united. It is reflected over the anterior surface of the iris, and closes the pupil while it adheres to the posterior lamina. From this arrangement it is obvious, that the membrane of the aqueous humour performs the office of a serous membrane, forming a sac without any opening. The humour filling it is abundant and very limpid.* The existence of the aqueous humour in the anterior chamber of the eye, previous to the destruction of the membrane closing the

* This humour which uniformly fills the anterior chamber of the eye, previous to the rupture of the membrana pupillaris, has been examined by M. Cloquet, and in all its habitudes with the reagents was found analogous to the fluid taken from the eye of an adult. This observation proves that the membrane of the aqueous humour is the proper secretory organ of this fluid, and that this organ does not exclusively exist in the posterior chamber, as has been asserted.

pupil, may be determined by various processes. First, by dividing the cornea with a lancet. Second, by opening the eye in the posterior part as will be pointed out. Third, and lastly, by freezing the eyes of aborted children. In the last instance, there is found in the anterior chamber a portion of ice convex in front, and presenting a plane surface posteriorly, and what is remarkable, the membrana pupillaris has not been destroyed.

The posterior chamber of the eye, at the period when the membrana pupillaris is perfect, is filled with a very limpid serous fluid, which runs out immediately as the cavity is opened. M. Cloquet is of opinion that it is similar to that contained in the anterior chamber.

Examined by the microscope, the membrana pupillaris presents no distinct fibres, but appears to be composed of a transparent, homogenous and gelatinous like substance. The two lamina are so adherent, that they seem to form but a single layer, in most cases. Nevertheless this separation is very evident in some particular instances.

The two layers of the membrana pupillaris are separated by blood-vessels, which are very distinct when injected with blood. Under these circumstances the examination is very satisfactory; at other times they are empty, colourless, and not to be discerned, unless we have recourse to desiccation.

The vessels of the membrana pupillaris are easily distended by various kinds of injections; they are however sometimes ruptured at the edge of the pupil, the injected matter is extravasated between the two layers of the membrane, imparting the colour and opacity, excepting where the vessels exist, which, remaining empty, appear like transparent striæ. In this state, the two layers of the membrana pupillaris can be easily distinguished by the microscope. When this extravasation occurs, the injected fluid does not cover the vessels on the anterior and posterior surfaces, and this is owing to the firm adherence of their surfaces to the corresponding surfaces of the two lamina, which are not detached at their edges.

We must be acquainted with the arrangement of the vessels of the membrana pupillaris, to comprehend the nature of the rupture.

The two long ciliary arteries given off from the ophthalmic

pass between the sclerotica and the choroides as far as the ciliary ligaments. Here each divides into two branches which go off at an obtuse angle, and advances towards the circumference of the iris, when they anastomose and form an arterial circle corresponding to this circumference. From this circle, supplied likewise from the anterior ciliary arteries, there are given off thirty or forty tortuous branches like radii, covering the anterior surface of the iris, and directed towards the pupil. In the adult these vessels are observed to divide into a number of branches, which, again uniting, constitute a smaller circle near the pupil, and from which arise capillary vessels going to this opening.

In the fœtus a different distribution is observable, previous to the rupture of the membrana pupillaris. The smaller arterial circle does not exist, and the branches arising from the greater circle, instead of terminating near the edge of the pupil, and forming the smaller circle as in the adult, are elongated between the layers of the membrane that closes the pupil. They proceed to the centre of this opening, forming very tortuous arches of various size and figure where the concavity corresponds with the edge of the pupil. They do not form a regular net-work as in the majority of the membranous textures, but in their tortuous disposition they resemble the vasa vorticosa of the choroides, or rather the vessels found in the pseudo membranes.

The vascular arches of the membrana pupillaris are very numerous; they do not anastomose with those directly opposite, but with those on their side; from this curious disposition there is formed, between the convexity of these arches towards the centre of the pupil, an irregular space, where the membrane is not supplied with vessels, and consequently much weaker than elsewhere.

M. Cloquet counted thirty or forty principal arterial branches, extending beyond the iris into the membrana pupillaris. Sometimes only eighteen or twenty can be discovered.

When thin vessels are distended with blood, or injected with any colouring matter, they are easily discerned through the transparent cornea; particularly when the eye is viewed against the light.

M. Cloquet did not discover any veins among these vessels. He never perceived that the injection filled them and the arteries, as happens often in other parts of the body.

Wrisberg states that he observed branches from the central artery of the crystalline, passing to the posterior surface of the membrana pupillaris. This anatomist infers that there is always a communication between the crystalline lens and the membrane closing the pupil. M. Cloquet, notwithstanding the most careful examination, could never discover these vessels.

Our colleague describes the different modes of preparation by which he was the most successful in ascertaining the structure of the membrana pupillaris. He preferred fœtuses of from five to seven months; as recent as possible, because the membrana pupillaris is soon destroyed by the kind of maceration it undergoes in the humours of the eye. He removes the whole organ carefully, he makes a circular incision through the sclerotica about one third of the distance from the union with the cornea; he then divides the choroides and retina, and separates the posterior portions of these membranes, preserving the vitreous humour entire. By placing the eye on a piece of white paper, the vessels of the membrana pupillaris can be easily distinguished, especially if they are injected. The vitreous humour and crystalline lens adhering to the hyaloid membrane, are to be carefully removed, the anterior portion of the choroides, and the iris remain united to the sclerotica, near the circumference of the cornea. In this way the membrana pupillaris is seen on its posterior surface, and the vessels may be discovered with the naked eye. The membrana pupillaris and the iris are raised by the aqueous humour contained in the anterior chamber, closed on all sides. By carefully dividing the membrana pupillaris; or, still better, by detaching the circumference of the iris, the aqueous humour is discharged, which may be then collected and examined.

This humour being evacuated, if air be blown into the anterior chamber, by means of a blow-pipe, the iris and membrana pupillaris will be raised, forming an elevation posteriorly. Then, with the point of a lancet, the iris is to be detached from the sclerotica and immersed in water, when the arrangement

of the membrana pupillaris will be distinctly seen. By seizing the iris with the forceps and agitating it in the water, the membrana pupillaris will be made to undulate from side to side according to the impulse it receives from the water. This membrane may be rendered still more distinct by steeping it in ink, which gives it a black colour.

M. Cloquet then gives the result of his experiments with injections of water, isinglass, spirits of turpentine, varnish, &c. for the purpose of rendering visible the vessels of this membrane. He describes the ingenious methods he adopted in making these injections, and in preserving the membrane. He remarks, that it is very difficult, if not impossible, to avoid destroying this membrane, in attempting to show it, if the opening is made in the transparent cornea, which is very thick in the fœtus. We acknowledge that we searched in vain for the membrane, by pursuing this last method, whence we were led to doubt its existence, whereas we have exhibited it without difficulty by pursuing the mode recommended by our author.

The membrana pupillaris does not remain entire during the whole period of pregnancy. Generally about the seventh, sometimes however about the sixth or eighth month, it is destroyed, so that no vestige remains at birth. How is the membrane removed? what is the cause of its disappearing? what becomes of it and the vessels with which it is so abundantly supplied? To resolve these questions, M. Cloquet has detailed the phenomena he observed connected with the rupture of the membrana pupillaris.

Towards the above mentioned period of gestation this membrane is unequally divided about the centre; a free communication is thus established between the two chambers of the eye, which were previously quite distinct, and the contained fluids become mixed. The rupture commences near the centre of the pupil, in the spot where the convex edges of the vascular arches are directed towards each other, and thence extends into the primary intervening spaces, the vessels remaining untouched. The membrane is not destroyed in the secondary spaces formed by each arch, for the filaments are fixed round

the pupil by one edge, the other portion being loose and floating.

The vascular arches remain connected with their filaments; they have not been broken, but being shortened, they are drawn from the centre of the pupil; they gradually diminish in size, and are finally confined to the edge of the pupil, constituting the smaller arterial circle of the iris, which had no existence previous to the rupture of the membrana pupillaris, and whose formation we are thus enabled to trace.

In the fœtus, the smaller arterial circle of the iris, which is only formed after the rupture of the membrana pupillaris, at the expense of its vessels, and which may therefore be termed pupillary, is situated on the border of the pupil. Frequently, in a new-born child, some of these vessels extend beyond the circumference of this opening; in the adult on the contrary, it is situated on the anterior surface of the iris, at some distance from its central opening.

Our author has examined, in a great number of fœtuses, the degrees of retraction of the arterial arches of the membrana pupillaris; he has observed that these vessels are nearer to the edge of the pupil in proportion as the period approaches birth. These vessels of the membrana pupillaris, form in part the coloured arches, observable towards the smaller circumference of the iris in adults, and which have been described by Haller Ruisch, and Zinn.

From the facts above stated, and which we have witnessed a great many times, M. Cloquet considers himself warranted in establishing the following propositions. We shall present them in his own words.

"1. The membrana pupillaris uniformly exists in the human fœtus, and generally remains perfect until the seventh month of gestation. Sometimes it is destroyed earlier, seldom at a later period. It can be discerned at the third month.*

"2. This membrane, previous to its rupture, forms within

* Dr. Portal is of opinion that the membrana pupillaris exists at birth. "Children, (says he,) when coming into the world have the pupil closed by a membrane so delicate, that it is ruptured in the delivery, or soon after birth." Anat. Med. tom. IV. p. 426.

the iris a complete partition between the two chambers of the eye.

"3. The anterior chamber of the eye, before the destruction of the membrana pupillaris, constitutes a closed cavity lined with a serous membrane (the membrane of the aqueous humour) which secretes and incloses the aqueous humour.

"4. The posterior chamber, being very small, contains at the same period a limpid serous fluid, but in much less quantity.

"5. The membrana pupillaris is formed of two lamina with numerous blood-vessels running between.

"6. These vessels are supplied from branches of the long ciliary arteries, which extend beyond the opening of the iris, forming tortuous arches between the lamina of the membrana pupillaris.

"7. These vascular arches do not anastomose, at their convex portions, with those directly opposite; there consequently remains, towards the centre of the pupil, a space where the membrana pupillaris is unsupplied with vessels and therefore weaker.

"8. The destruction of the membrana pupillaris is neither to be attributed to its maceration in the humours of the eye, nor to mere absorption; for after its rupture the floating filaments and vessels are always distinctly seen.

"9. From the facts I have observed and which are recorded in this memoir, I think it must be admitted, that the rupture of the membrana pupillaris is owing to the retraction of the vascular arches, which retire towards the smaller circumference of the iris, receding from each other and consequently from the centre of the pupil. It is possible likewise that the iris, by its contractions, co-operates in the rupture of the membrane which closes its opening.*

* The membrana pupillaris (observes the author,) being torn in the middle, where it is thin, and not supplied with vessels, no hemorrhage can occur. But how shall we explain the retraction of the vessels so as to occasion the rupture of this membrane to which they adhere so strongly? what is the proximate cause of this phenomenon? It would be attempting to explain the reason, why, at a certain period, and in the fœtus likewise, the gubernaculum testis, by contracting, draws down the testicle from the abdomen

"10. The small arterial circle of the iris does not exist in the fœtus previous to the rupture of the membrana pupillaris; it is formed by the vessels of this membrane which have receded towards the iris without having experienced the smallest laceration.

"11. The small arterial circle of the iris, situated on the edge of the pupil in the fœtus, recedes on the anterior surface of the iris in the adult.

"12. The looseness of the anastomosing arches of the small circle of the iris is favourable to the dilatation and contraction of the pupil."

M. Cloquet has twice observed in the membrana pupillaris, very delicate vascular ramifications uniting opposite arches. In these instances they must have been destroyed by the rupture of the membrane. "Perhaps such an anatomical structure, he remarks, has prevented the rupture of this membrane in some of the individuals blind from birth: this hypothesis seems confirmed by an observation from Wrisberg, where the membrana pupillaris was found in a child who died of the small-pox, at the age of three years and a half." This anatomist, desirous of ascertaining the cause of the blindness, injected the dead body. The colour of the pupil was paler than natural: nevertheless it was not so remarkable as in persons affected with cataract; but resembling rather what is observable in the eyes of aborted children. Besides this paleness there were discovered some very delicate vessels passing across the pupil. Wrisberg removed the cornea, and perceived the iris

into the scrotum and causes the production of the cremaster muscle and the spermatic cord. (Vid. the Anatom. Researches of the author, on Hernia. July 1817. printed by Mequignon-Marvis.

Professor Portal states, in treating of the membrana pupillaris, "Generally this membrane is ruptured the moment the child is born; in some children it is not so easily broken, but remains after birth." He puts the question, whether we may not discover the cause of this rupture in the greater afflux of the aqueous humour, or in the motions of the eye, which are more considerable and more frequent after birth? Do not the contractions of the recti and obliqui, he states, by compressing the globe of the eye, occasion the rupture of this delicate reticular membrane. (Cours d'Anat. Med. tom. V. 581. The opinion of this physician is opposed to the observations of Haller, Albinus, Wrisberg, and lastly those of Cloquet.

continued into the membrana pupillaris, the vessels of which were filled with injection. This membrane, being rather firmer in the parts supporting the vessels, was in all respects analogous to the membrana pupillaris in the fœtus. Littre exhibited to the Academy of Sciences, in 1707, the eye of a man aged twenty-two years, whose pupil was closed by a delicate slightly opake membrane, which was attached to the whole circumference.

It may likewise happen, that though the membrana pupillaris is broken yet the filaments do not completely recede to the edge of the pupil. Doctor Beclard, at the head of the Anatomical Department of the Faculty of Medicine, has informed us and the author, that he had observed in two adults irregular filaments of the membrana pupillaris which partially concealed the opening in the iris, and rendered vision indistinct.

M. Cloquet has promised shortly to publish his observations on the membrana pupillaris of brutes.

He has presented to the Academy of Sciences eleven preparations of the membrana pupillaris of the human fœtus, and has given, at the end of his memoir, the description of these specimens which he kindly permitted us to examine, and which he proposes to deposit in the collection of the Medical Faculty. He has added to his memoir a lithographic print executed from nature, and which gives a very perfect idea of the preparations which we examined.

Observations on Phagedæna Gangrænosa. By H. Home Blackadder, Surgeon.

[From the London Medical and Physical Journal, for September 1818.]

In a preface, Mr. Blackadder makes some remarks on the importance of the subject of his work; and deprecates the prejudice in favour of the paramount and almost exclusive importance many surgeons of the present day are disposed to attach to the daring parts of operative surgery; but while he is willing to allow that such subjects are in themselves not

without interest, he is still inclined to believe that they are most fitly ranked with the monstrosities of nature; and that they are calculated to attract attention, rather from their singularity, than from any great or general advantages to be derived from them. The one shows what Nature can sometimes do of herself; the other, what injuries she can put up with from the hand of man; and, doubtless, both are objects of laudable curiosity. "But who," continues Mr. B. "could wish to see his art come to that pass, when only such credentials as contain a list of the number of carotid arteries, hip-joints, &c. he has operated upon, are considered valid for the reception of a surgeon into the confidence of the public?" This reminds us of a sentiment of Mr. Hunter. He said, he never approached a patient to perform an operation, without feeling humiliated; it was like the means a savage employs to accomplish his ends; what a man of a cultivated mind would execute with ease and gentleness, is by him done with force and violence. How peculiarly expressive is this, coming from such a man as Mr. Hunter. It speaks more than all the volumes that have been written on the advantages of science, and the beauty of modesty. It is itself a code of professional morals, and the τὸ καλὸν at which we all should aim.

The observations contained in this work, Mr. Blackadder states, were arranged as early as the year 1814, with the intention of having them inserted in a periodical publication; but a circumstance withdrew his attention from the subject, and, till a short time since, he wanted leisure or opportunity for again reverting to it.

"Phagedæna, or Phagedenic Ulcer," the author says, "is a term which has long been in use with writers on surgery, in treating of the history and cure of ulcers; and has been employed to designate those foul and irritable sores which exhibit a constant disposition to spread or enlarge; and which, in their progress, are frequently marked by an evident loss of substance. By modern writers, its application has been more restricted; being generally confined to those spreading ulcers which are not confined to any one texture, but which most commonly have their site in the integuments and cellular substance."

He proposes an arrangement of this kind of ulcer into the following species:—*Simplex*, *Cachectica*, *Venerea*, *Hydrargyrosa*, *Herpetica*, *Cancrosa* and *Gangrænosa*. This arrangement is obviously imperfect, which the author admits, and it is also in other respects objectionable; but, as he purposes to treat on the last species only, we do not think it necessary for us to make any particular remarks on it.

This work is divided into two parts. The first, containing the history and cure of the disease, deduced from his own observation and experience; the second, an investigation into the history and treatment of it, as it is to be found in the writings of various ancient and modern authors.

"Phagedæna gangrænosa," says the author, "is the name by which I mean to designate that disease which, in this country, is usually denominated hospital gangrene, and which is familiarly known to the French surgeons under the appellation of "*la gangrene humide des hôpitaux.*" It has also been taken notice of by different writers under various other names; such as the putrid, scorbutic, contagious, malignant, gangrenous ulcer, hospital sore, *pourriture d'hopital*, &c.

He apologises for making use of a new term; but considers that, if the view he has taken of this affection be correct, it was no less requisite than allowable. That which he has adopted is strictly proper, as expressing the principal characteristics of the disease. After some general observations on the rapid progress, extensive ravages, and fatal tendency of this malady, Mr. Blackadder proceeds to give an account of Passages, a small sea-port town of Guipuscoa, in the province of Biscay, where he first became acquainted with it. Passages is situated on the side of an inlet from the sea, which is surrounded by high hills; and, from an entrance extremely narrow, it extends to the distance of about three-quarters of a mile, and terminates in a large natural basin, from which the rising grounds gradually recede. This basin, though now nearly choked up with mud, was once a principal rendezvous for the Spanish navy. The long narrow street, or lane, of which the town principally consists, had been originally cut out of the basis of a hill. In several places, it lies so low as to be on a level with the sea at high-

water mark. The population had usually been from about sixteen to eighteen hundred; but, after the destruction of St. Sebastian, the number of inhabitants, including the British army, amounted to seven thousand. The town was so completely filled up, that the cellars, stables, and even the arch-ways, were, during the night, promiscuously occupied by men, boys, mules, and horses. The climate, during winter, is cold, moist, and changeable. During that in which the town was occupied by the British troops, it rained almost incessantly. The thermometer was seldom higher than 55°, and less frequently so low as 32°. Fuel was extremely scarce. From this town being in the immediate rear of our army, and affording the accommodation of a convenient harbour, it became the place at which all reinforcements were landed, and to which such of the sick and wounded, as were likely to require a considerable time before they could be fit for active service, were sent.

Mr. Blackadder was, in November 1813, appointed resident medical officer of a division-hospital in this place. About this period, three patients were admitted with simple flesh-wounds of the lower extremities. They were young, healthy, stout-looking men, and were able to walk about without experiencing much inconvenience. He remarked, on removing the dressings from their wounds, that the nature of the discharge, and the general appearance of the sores, were somewhat different from any thing he had before witnessed. This proved to be the commencement of hospital gangrene. He says,

"Upon laying these cases before Mr. Baxter, (surgeon to the Forces,) I soon learned that I had to attend a disease with which I was practically, and, in a great measure, theoretically ignorant. I had also the mortification to learn that it had made extensive ravages in other hospitals, that medical officers were much divided in opinion, both with regard to its nature and method of treatment."

He was instructed to use a lotion, composed of nitrate of potash dissolved in vinegar, which was to be kept constantly applied to the sores. This application, which was continued for three days, occasioned violent pain, while the disease was

in no degree arrested in its progress; but, owing to the removal of these patients to another hospital, he was prevented any longer watching the progress of their complaint. About three weeks after these patients were sent away, a number of men were admitted, most of whom had been recently and severely wounded. It was discovered that four of them were affected with gangrenous phagedæna; and according to their own account, their wounds had been in that state from six to ten days previous to their admission into this hospital. From these cases, the disease was communicated to every ward in the hospital; and, in less than two weeks, a great proportion of the open sores had become affected with it.

Every known means, every thing that was likely to prove beneficial, was had recourse to. In some cases it was attacked through the medium of the general system, in others by topical applications; but with equal want of success. The state of the sufferers is described by Mr. Blackadder in a manner which evinces his symypathy with them, and the exertions he made for their relief; and the line of conduct that should be adopted by medical attendants in such circumstances is traced with much judgment, spirit, and decision. Seeing that all the measures hitherto employed hardly even mitigated the disease, he says, " It appeared that the only way of arriving at a more effectual method of treatment, would be still more carefully and minutely to watch the progress of the complaint through its different stages, and thereby endeavour to acquire a more intimate knowledge of its character." By these means he at length became satisfied of the truth of the following particulars:

" 1. That the morbid action could almost always be detected in the wound, or sore, previous to the occurrence of any constitutional affection.

" 2. That the constitution did not, in several instances, become affected, until some considerable time after the disease had manifested itself in the sore.

" 3. That, when the disease was situated on the inferior extremities, the lymphatic vessels, and glands in the groin, were observed to be in a state of irritation; giving pain on

pressure; and were sometimes enlarged before the constitution showed evident marks of derangement.

"4. That the constitutional affection, though sometimes irregular, was in many cases contemporary with the second, or inflammatory stage.

"5. That all parts of the body were equally liable to become affected with this disease.

"6. That, when a patient had more than one wound, or sore, it frequently happened that the disease was confined to one of the sores, while the other remained perfectly healthy; and that, even when they were at no great distance from each other."

The first of the above series of observations differs from what has been related by some writers on this disease. Professor Brugmans, of Leyden, in a Memoir, which obtained the prize given by the Society of Sciences at Haarlem in 1814,* says, "Before any change in the wound is perceptible, the patient complains, sometimes a few hours after entering the hospital, of a most disagreeable sensation throughout the whole body, but particularly in the arms and legs; lowness of spirits, and disinclination for food follow; the tongue is dry, and frequently covered with a yellowish coat; the thirst is inconsiderable when the appetite ceases; the pulse becomes unequal, small, and accelerated."—Moreau also absolutely asserts, that the constitutional symptoms precede the local; and so does Mr. John Bell, in his Principles of Surgery. It is difficult to discover, from the writings of the greater number of the French surgeons, what opinion they held respecting the order in which the symptoms occur. They, however, in general, agree in this—that topical management is of the first importance in checking the progress of the local disease.

Mr. Hennen, when treating on hospital gangrene, in his work on Military Surgery, says, "I have reason to suppose that the sloughing, in some cases, preceded the fever; but in all the others, as nearly as could be traced by attentive inspection of the sores, both appeared at the same time." (P. 253.) In another place he states, that "some had extensive

* Inserted in the 34th volume of our Journal.

local disease without any general affection. These cases I have principally observed to occur from the inoculated slough, among the attendants, who occasionally respired a purer air than the patients; and among the assistants, whose accidental scratches were best treated by destroying the part with nitrated silver."—"The slightest scratch of the dissecting knife festered; ulcers, whether simple or constitutional, became gangrenous; wounds, long healed, broke up; nay, the skin, although perfectly sound, which had been touched with a sponge employed in washing the gangrenous sores, ulcerated, and soon became itself a slough. This was observable among the orderlies and nurses."

Professor Brugmans states, that, in the year 1799, a quantity of lint was purchased in France, to be distributed in the various hospitals of Holland. Wherever it was used in dressing ulcers, a very violent hospital gangrene was the consequence. The fact was inquired into, and it was found that, in the place from which the lint had been brought, they were in the habit of washing the bandages, and other articles used in hospitals, in order to arrange them, and sell them as new lint. Pelletan states, that he saw the disease thus disseminated; and Pouteau, that it has been manifested frequently in patients by the application of surgical instruments which had touched an ulcer infected with it.

From the above-mentioned facts, and from that contained in the sixth of the series of observations of Mr. Blackadder, which is confirmed by the testimony of Professor Brugmans, Dr. Rollo, and Mr. Hennen, it is evident that gangrenous phagedæna arises from a specific morbid poison, and that constitutional derangement is not necessarily connected with it; consequently, that the first-mentioned observation of Mr. Blackadder may be correct *in the greater number of instances*. Thus far we agree with the author; but we are not disposed to accede to that as being the *absolute* law of the progress of the disease, considering that the testimony of some accurate and judicious observers would lead us to form opposite conclusions. We postpone the further consideration of this question, until we arrive at that part of the work in which the author expressly treats on the history of the disease.

Mr. Blackadder submitted his opinion on this subject to a senior medical officer; but he was informed that gangrenous phagedæna was generally considered a *constitutional disease.* On inquiry, he found that the mode of treatment, modified by the various theories which different individuals had adopted, was particularly directed to the diseased actions of the system.

" Notwithstanding," says the author, " the discouraging impression which this information was calculated to produce, it was not sufficient to remove the conviction which I felt in the accuracy of the preceding observation; and I could not avoid taking another opportunity of stating it as my opinion, that, if any thing could be found effectually to destroy the diseased action in the sore, it would also be found to effect the greater part of a cure; and that, were it consistent with the present ideas of medical officers in the army to treat this disease agreeably to the aphorisms of Hippocrates, ' that diseases which medicine will not cure must be referred to the knife, and, if that prove unsuccessful, *recourse must be had to cautery*,' I did not entertain a doubt, but that such a practice would be followed by the most happy events.—The employment of the cautery was, on this occasion, considered inexpedient; but I was given to understand that I was at liberty to use any remedy that was not inconsistent with the general practice and opinions of British military surgeons. Under these circumstances, the oxide of arsenic occurred to me as an article that was probably possessed of powers sufficiently active for effecting the purpose intended, and of supplying the place of a more powerful, though less gentle, remedy."

This, however, was not contained in the apothecary's stores; but he obtained some of Fowler's solution, which was employed, diluted with an equal quantity of water. Two severe cases in the inflammatory stage of the disease were first selected. The patients were directed to keep their sores constantly moist with the solution, and to renew the lint at least once in two hours. They were supplied with opium, to take in case the pain produced by it should become excessive.

" On visiting my patients next morning," says Mr. B. " it was impossible not to be struck with the change in the expres-

sion of their countenances—from that of acute pain, mingled with despair, to that of ease and gratulation. Upon examining their sores, I found them completely dried up, and covered with a dark, semi-transparent, and insensible slough, of a somewhat horny consistence."

The farther progress of the disease was evidently and completely arrested, and, by suitable applications for resisting nature in throwing off the slough, and in cicatrizing the sores, they were, in no great length of time, completely cured, without having used any internal medicine, farther than what might be occasionally required to prevent constipation of the bowels. Mr. B. continues,

"From this period, I never saw an instance in which this method of cure failed of success, when the remedy was timely and properly employed. Patients, whose sores had resisted, as was said, almost every other treatment, were admitted from other hospitals, and cured by it; and it was also, as I was informed, ultimately introduced into other hospitals, and proved equally successful."

We now arrive at the second chapter, in which Mr. Blackadder enters more fully into the consideration of the history of gangrenous phagedæna. The development and progress of the disease are described with much minuteness, and, we doubt not, with equal accuracy; and the character of it, as depicted by him, accords with the opinion he has formed of the nature of the affection. We would gladly transcribe the whole of this account, but our limits confine us to those points which tend to prove the origin of the disease from the local contact of a specific morbid poison. We must, however, state that these extracts will convey a very imperfect idea of the value of this part of the work; and of the accuracy, penetration, and disposition carefully to investigate facts in their series and order, so manifest in the character of the author. After observing, that the general appearance and *odour* of the sore is such as cannot be mistaken by a person accustomed to witness the disease, he says,

"When the morbific matter, which produces this disease, has been applied to some part of the surface of the body from which the cuticle has been removed, as by a blister, the first

morbid appearance which presents itself is that of one or more small vesicles, which are filled with a fluid, in some instances having a watery appearance, while in others it resembles a bloody serum. The situation of the vesicle is generally at the edge of the sore: its size is not unfrequently that of a split garden-pea.

"During the formation of the vesicle, the patient is generally sensible of a change in the usual sensation of the sore, which he cannot well describe, but which is accompanied by an occasional painful sensation, resembling the stinging of a gnat."

The vesicle, in one or two days after its formation, assumes the appearance of a slough, which begins to extend, and spreads with more or less rapidity, until it occupies the whole surface of the original sore; and, when left to itself, there is little or no discharge, but the slough acquires daily a greater degree of thickness. When the formation of the slough has been interrupted, the stinging sensation becomes more acute, phagedenic ulceration quickly commences, and in a few hours a very considerable excavation will be formed. The edges of this cavity are well defined. The lymphatic vessels are, in many cases, irritated. The soft parts in the vicinity of the sore become painful, tumified, and indurated; and in persons of plethoric and irritable habits, an attack of acute inflammation supervenes. This generally subsides within from two to five days: the slough on the sore becomes more moist; matter is discharged around its edges; it then begins to separate, and is soon thrown off, but only to prepare the way for an extension of the disease, by a continued process of ulceration, and a recurrence of the last-mentioned symptoms.

This account of the progress of gangrenous phagedæna agrees exactly with that of the disease termed *sloughing phagedæna* by Dr. Adams,* or the *nigrities serpens* of Celsus. There is an important symptom, described by Brugmans as characteristic of hospital gangrene, which is not mentioned by Mr. Blackadder: he observes, "there is often found, at some distance from the ulcer, *a circle of a deep red, which extends more and more in concentric lines.*"

* Treatise on Morbid Poisons, ch. v. p. 57.

The author then describes the appearance of the disease when it supervenes upon an old sore, where a considerable depth of new flesh has been formed: "it is then seldom detected until it has assumed the form of a small dark-coloured spot on some part of the surface, and generally at the edge of the sore, as has been noticed in the foregoing variety. But, by careful observation, it has been ascertained in several instances, that it commenced, as in the former instance, in the form of a vesicle." The future progress of the disease is nearly the same in both cases.

"When the morbific matter has been inserted under the cuticle by puncture, superficial incision, or scratch, the progress of the disease, in its early stages, can be more accurately observed than in any other instance; but, as the symptoms which are exhibited during the first nine or ten days after vaccine inoculation has been performed, are so well known, and have been so frequently described, all that seems necessary on the present occasion is to observe that, with the following exceptions, the two diseases bear so striking a resemblance to each other as to render a particular enumeration of the symptoms unnecessary. The primary inflammation in gangrenous phagedena commences at the end of the second, or early on the third, day; the inflammation is at its height about the sixth: when the scab begins to form in one disease, phagedenic ulceration commences in the other."

Here, however, we have the specific distance of the inflammation attending the action of a morbid poison evidently referred to.

"When it supervenes upon a recent gun-shot wound, the discharge is at first found to be lessened in quantity, and to have become of a sanious nature; the sore has a certain dry and rigid appearance; its edges are more defined, somewhat elevated and sharpened; the patient is sensible of a change in the usual sensation in the sore, and he also complains of the occasional stinging before mentioned. The integuments at the edge of the sore become inflamed, and the surface of it assumes a livid or purple colour, and appears as if covered with a fine pellicle: this gradually increases in thickness, forming what has been termed a slough. An offensive matter then

begins to be discharged, and the edges of the sore, which are usually jagged or pectinated, become extremely irritable, of a deep red colour, and dotted on their inner surface with numerous, small, elevated, and angry-looking points, which may be considered as one of the characteristic marks of the disease."

Some observations follow on the variation of the degree of local inflammation, from the habit of body of the patient, season of the year, &c. and the appearance the sore assumes in different parts; after which the author proceeds to the consideration of the constitutional symptoms, and which he states never to have had an opportunity of seeing precede the local, —" unless it be held, as an exception, when the disease has supervened upon a stump, after amputation has been performed on account of the previous effects of the disease."

"The period at which the constitution begins to exhibit symptoms of irritation is extremely irregular: sometimes it is so early as the third or the fourth day, and sometimes even so late as the twentieth."

It assumes more of an inflammatory or typhoid character, as the particular causes producing these modifications have been predominant. These are described with much accuracy and judicious discrimination; after which, the author points out the diagnostic symptoms of the local disease, and observes that it is liable to be confounded with phagedena cachectica, the mercurial phagedena, the scorbutic ulcer, and that morbid action which supervenes upon a wound when the constitution becomes affected with some acute disease.

The origin of gangrenous phagedena is next considered. After mentioning the opinions generally adopted, Mr. Blackadder says,

" Whatever may be the source of this disease, it is, at least, sufficiently ascertained that, when it occurs, its progress is only to be prevented by the most rigid attention to cleanliness; and by insulating the person or persons affected, so as to prevent all direct intercourse between them and the other patients; for, so far as I have had an opportunity of observing, ninety-nine cases in the hundred were evidently produced by a direct application of the morbific matter to the wounds or sores, through the medium of sponges, tow, water, instruments,

dressing, &c.; while others, who were, in every other respect, equally exposed to its operation, never caught the disease. In attempting to prove this by experiment, I have placed three patients with clean wounds, (one of which was an extensive wound of the thigh, another a wound of the leg, and a third a stump of a thigh,) alternately between three other patients severely affected with the disease. They lay in a part of a ward which was appropriated for patients who were labouring under the disease, and of whom there were, at the same time, a considerable number. Their beds were on the floor, and not more than two feet distant from each other; but all direct intercourse was forbidden, and they made fully aware of the consequences that would follow from inattention to their instructions. The result of this trial was, that not one of the clean wounds assumed the morbid action peculiar to the disease, nor was the curative process in any degree impeded. I have likewise had an opportunity of witnessing a similar result in two instances of this disease occurring after amputation; in both of which cases the patients lay in small apartments, each containing from six to eight patients with healthy wounds; but in neither case was the disease disseminated, although it proved fatal, in both instances, to the individuals affected with it."

We have before remarked, that the testimony of surgeons who have had opportunities of investigating this subject, and of the accuracy of whose observations we are disinclined to doubt, is in opposition to that Mr. Blackadder. Although disinclined to multiply authorities unnecessarily, we cannot forbear adducing the following circumstance, related by Professor Brugmans.—" At Leyden, at the end of the summer of 1798, in the French military hospital, the hospital gangrene prevailed in one of the lower wards, while the other patients, attacked with slight wounds, and placed above this room, in an airy attic, were free from the evil. The surgeon on duty thought it expedient to have a hole cut in the floor, in order to procure a vent for the foul air, in its progress through the roof. Thirty hours afterwards, the three wounded men, who lay in the garret nearest the aperture, were attacked with gangrene, which soon spread throughout the whole room."

Much benefit will accrue to practice from the view Mr.

Blackadder has taken of gangrenous phagedena; and in those cases particularly in which it is primarily a local affection, (and that it may be so in many instances we perfectly concur with him,) the advantages that will be derived from his mode of treatment, above that of any previously adopted, (if we except the actual cautery, employed by the French, which M. Roux calls an *heroic remedy*, and the want of permission to use which in the English army is so feelingly regretted by Mr. Blackadder,) are evident, and of the utmost importance; but, in the present state of our knowledge respecting it, we consider that the arrangement of a military hospital, on the principle that it cannot be disseminated through the medium of the atmosphere, and in the manner in which those diseases usually termed *infectious* are done, would be an imprudent measure. We must, however, endeavour to do justice to Mr. Blackadder: that he is a man of acute penetration, accurate discrimination, and nice judgment, is most clearly evident; and the work before us is an admirable specimen of what may be deduced from the application of such talents; but we consider the series of facts from which his conclusions are drawn are not sufficiently extensive to determine our opinion on the nature of the disease under every modification of circumstances, considering that the testimony of other judicious observers would lead to opposite conclusions.

Several species of ulcers are described by Dr. Jackson,* which he considers appear under such circumstances as if they depended on some inexplicable modification in the action of the cause of fever—endemic or infectious. In particular places, and at particular seasons, they are so frequent as to be in a manner epidemic. We transcribe his account of the second species.—"The beginning of which is marked by the appearance of a pimple—hot and painful from the commencement, the pain sharp and stinging. The cuticle separates; the discharge is thin, sharp, and acrid. The circle of the pimple expands; the edges become red, and what is termed angry, with sensations of burning heat, sharp and pungent pain. The ulcerating process commences, and extends; the true skin is destroyed; the ulceration penetrates into the adjacent parts

* Sketch on Febrile Diseases, chap. iv. § 2.

with more or less rapidity, affects the membrane of the bone, and, on many occasions, the bone itself. The discharge from these rapidly-spreading ulcers is sometimes thin and acrid, so as to excoriate, by its sharpness; sometimes a copious, glairy, dusky coloured, jelly-like, substance, more or less bloody; the surfaces underneath, and even the edges, are foul and fungous, or the adjacent parts break down rapidly into a disorganised mass." "This ulcerative form of fever is not common in the less healthy months of the year, where common fever most prevails, nor at the most unhealthy points of an unhealthy sea-coast. To this it may be added, that ulcer and formal fever do not ordinarily occur in the same place, much less in the same subject at the same time; but that, when the ulcer has healed, or when it has assumed a healing appearance, fever supervenes not unfrequently; and that it is mild and tractable when it does supervene, or violent and malignant in the last degree of malignancy, according to what had been the character of the preceding ulcer. It was the observation of this and other analogous facts, which induced me to rank the ulcerative form of disease, whether endemic or infectious, as I now do. The propriety of the arrangement may be disputed; I contend only for the accuracy of the fact as here stated."

We do not adduce this as hospital gangrene; but we consider that it may throw some light on the nature of that disease, which we have long considered, and have so expressed our opinion in various instances, as arising from the local effects of those causes, which, affecting persons without wounds, would produce what is usually termed typhous fever. If this notion be thought correct, it will explain the disputed point respecting the order in which the symptoms occur in gangrenous phagedena; as it will show that they may, like smallpox and some other diseases of this kind, take place in either way.

There is one important circumstance respecting hospital gangrene which we believe we have not mentioned, that of its recurring several times; this is noticed by all the practical writers on the subject. The sore will cease to spread; the slough become detached; and an appearance of healing take place: when, suddenly, without any evident cause, the peculiar mor-

bid action will return, and the sore will again run through the process of inflammation and sloughing. It appears that, after a short time, the parts regain a susceptibility of the influence of the poison which may have been taken up from the sore, and then affects it through the medium of the general system. This is not consonant, as far as we are acquainted, with the laws of those morbid poisons which affect the general system primarily, causing an acute attack of fever and secretion of a poisonous matter similar to that which produces the disease. The fever is considered by writers in general as acute or idiopathic, and of the typhoid character; but the description Mr. Blackadder gives of it, is that of fever symptomatic of local inflammation, or the irritation of the sore. This, with the repeated occurrence of the disease, is conformable to what we know of the law of those morbid poisons whose primary effects are local.

The author next treats on the method of cure, which resolves itself into two principal indications:—1st, to destroy the morbid action in the sore; 2dly, to regulate the re-action of the system. Our limits will not permit us to enter fully into the consideration of this part of the subject; and we have already mentioned the chief means of acomplishing it. There are a few circumstances, however, respecting it, on which we consider it necessary to make some observations. It has been stated that the external application of preparations of arsenic is not unattended with danger; Mr. Blackadder has never witnessed, but in one instance, any bad effects which could possibly be attributed to it; and this evidently arose from its having been applied in an improper manner. The French surgeons sometimes employ an arsenical paste; and instances are related of its employment having been followed by death, and of which it was apparently the cause. Mr. Blackadder considers that it is highly probable that the blame, in these instances, did not rest with the remedy, but the manner in which it was employed. It may be applied to a sore in such small quantities as to admit of its being absorbed into the system; but, by using it in sufficient quantity, quickly to destroy the organization of the part, such absorption may be prevented.

The sores should be kept perfectly clean by means of a

solution of potash and tow alone employed for this purpose, that every thing imbued with matter from them may be destroyed. Amputation has sometimes been had recourse to; but Mr. Blackadder states, that this was almost uniformly unsuccessful, the morbid action occurring in the stump. He then says,

"It may, therefore, be asked, if the disease can be removed by a topical application, acting merely as a cautery, why may not amputation answer the same purpose, seeing that the whole sore, and nidus of the disease, would thereby be effectually removed? And why should the disease again break out on the new surface of the stump, provided the patient be secured from any fresh source of contagion?"

To these questions, Mr. Blackadder replies, that the arsenical solution destroys the morbid action in the sore; yet, in many cases, the constitution must have become contaminated, by absorption of the poison; but we find that the natural powers of the system are such, on this as well as on the other occasions, as to be able gradually to rid itself of this portion of morbific matter. Thus we find that, although the local morbid action be overcome by the arsenical solution, it will frequently recur again and again, requiring similar means for its removal; so that the arsenic may be said to arrest the local progress of the disease; and prevent a fresh production of morbid matter, until the natural powers of the constitution are able to overcome the disease and effect a cure: or, as we should say, until the constitution is no longer susceptible of the irritation of the poison.

"The second indication of cure (says the author) will seldom require to be much attended to, if sufficient attention has been paid to the first symptoms of the disease: but, when the constitution demands attention, the re-action must be moderated or supported according to the plethoric or exhausted state of the patient."

We now arrive at the second part of the work, which contains an investigation into the history of gangrenous phagedena, as it is to be found in the writings of various ancient and modern authors. Mr. Blackadder here endeavours to prove, that the disease which forms the subject of this inquiry, far

from being, as by many supposed, either new or overlooked, was not unknown; but, on the contrary, that its most appropriate treatment is distinctly pointed out by some of the oldest writers on surgery; and in this we consider Mr. Blackadder has succeeded. After mentioning the principles on which this inquiry was conducted, the author says,

"It is, nevertheless, in its present form, far from being what I could have wished, or what was intended, and is, indeed, only a small part of the materials that were collected with the hope of being able to lay something more worthy of perusal before my readers; but, owing to a state of health which little admits of that close or constant application without which small progress or improvement can be made, either in literature or the sciences, I am forced either to place it, unfinished as it is, at the mercy of my readers, or what, to one who may have some professional zeal, and withal, not destitute of the ambition of being useful, is equally repugnant, to allow it to remain in its original obscurity. Those, who are accustomed to study their own minds, will at least not be surprised at the, perhaps unfortunate, alternative I have chosen."

We, who are not untried in those matters, well know the toil and difficulties he has undergone, and must bear testimony to our readers of the value of the fruits of his labours. We cannot, from the nature of the subject, give an account of the information it contains; and this we are less anxious to attempt, because we are confident that no one who has a due degree of zeal for the cultivation of surgery will neglect to make himself possessed of the work before us. We shall, however, take a cursory view of its contents, both because we feel a reluctance to dismiss such interesting matter unnoticed, and that the author has interspersed some remarks which we did not find in his practical history of gangrenous phagedena.

Mr. Blackadder commences with an effusion of admiration for men who now live the life of immortality; and a reprehension of folly and presumption, evidently dictated by a mind ardent with the love of nature and of truth.

He seems to consider the *Therioma* of Celsus, terminating in *Phagedæna*, as what he has described as phagedæna gangræ-nosa. The appearance of that ulcer without any evident cause,

(*per se nascitur*) accompanied with a peculiarly disagreeable odour, stinging pains, extraordinary degree of surrounding inflammation, hæmorrhage, the rapid increase and extensive ravages it made, the fever which sometimes ensued, and the mode of cure by actual cautery in obstinate cases, appear to indicate its origin from a morbid poison; and the symptoms certainly bear a strong resemblance to those of hospital gangrene. Roland and Belloste, in particular, appear to have witnessed the disease; the remedies they employed were composed of lime, colcothar of vitriol, and arsenic. Some valuable observations and extracts from the works of Rogerus, Brunus, Lanfrancus, Guido, and Ferrus, ensue. Ambrose Parey mentions a state of wounds after injuries, both from gun-shot and swords, which has some of the characters of hospital gangrene; but he is not very particular in his description, considering it to arise from a corrupted state of the atmosphere. His remedy was the Unguentum Ægyptiacum. We pass over Wiseman and Horstius to La Motte, who distinctly describes it as occurring at the Hôtel Dieu. His remedies were mel Ægyptiacum, storax, and other warm and spirituous applications. In the posthumous works of M. Pouteau are two memoirs on this disease; he considered the disease as contagious, and the consequences he witnessed from it such as to make him ask, "Have hospitals been more beneficial or pernicious to human nature." He employed the actual cautery; or, if the surgeon or patient were so timid as to be terrified at the use of this remedy, boiling oil, with the addition of some acrid substances might be substituted for it. He then notices a paper written by Dr. Gillespie on this disease. The observations of Dr. Adams on *Sloughing Phagedena*, in his work on Morbid Poisons, are next referred to. On these, Mr. Blackadder makes no remarks, considering that every one is familiar with the work; and because (in the words of the author) "it is next to impossible to do justice to him, without making much larger extracts than is, on the present occasion, admissible; more particularly as my attention is principally directed to the practical observations of such as have themselves been actors on the stage." Here we consider Mr. Blackadder has fallen into an error; it is evident to us that Dr. Adams did not con-

sider the disease he termed sloughing phagedena as hospital gangrene; and therefore, his observations are not at all applicable to this question.

Some remarks ensue on the memoir of Citizens Moreau and Burdin. The account Dr. Rollo published of this disease, at the end of his Treatise on Diabetes, as it occurred at the Military Hospital at Woolwich, with which we suppose our readers are well acquainted, is next considered. The observations of this gentleman on the nature and progress of the disease, and his principles for the method of cure, very nearly accord with those of Mr. Blackadder. We can merely notice the names of the authors who have subsequently written on the subject, which are—Mr. Ballard, Dr. Harness, (whose observations were communicated in the 4th volume of our Journal,) Mr. Edwards, Mr. John Bell, Dr. Trotter, Mr. Caird, Mr. Brown, Mr. M'Dowal, Mr. Arthur, Mr. Little, M. Larrey, M. Delpech, and Dr. Thompson.

In the course of his remarks on the work of M. Delpech, the author says,

"I do not wish it to be understood that I believe it impossible for this contagion to be, in any given circumstance, conveyed to a sore through the medium of the atmosphere; but there cannot be a doubt, that by far the greater bulk of the evidence we are possessed of, goes to support an opposite view of the subject; and, therefore, I contend, that the facts which have hitherto been brought forward in support of this mode of propagation, being in no instance decisive, can at most be only considered as exceptions to a general rule. I have frequently had occasion to remark, on removing fomentations or poultices, which had been applied to sores affected with this disease, and even when the temperature of the atmosphere was upwards of 60° Fahrenheit, that a dense white vapour arose, and was in some instances visible upwards of six inches above the sore. It seems, therefore, possible, that a small or crowded apartment may, through the ignorance or negligence of the medical attendant, be made to resemble a vapour-bath, by the effluvia from the sores being allowed to accumulate so as to be almost visible. In such a case it is not improbable, that the disease would be propagated through the medium of the at-

mosphere. This, however, I would consider equivalent to inoculation or immediate contact."

It is obvious that those, whose observations have led them to consider the general system as primarily affected, could with equal propriety apply this mode of reasoning to favour their opinions respecting the manner in which the disease may be disseminated. We must, however, remark, that the character of the sore appears more to resemble that arising from local contact of a morbid poison, that from specific action consequent on general disease of the system.

Our limits will not permit us to dwell any longer on the consideration of this work; but we cannot pass over the remarks of Mr. Blackadder on the observations of Dr. Thompson on hospital gangrene, without declaring our approbation of them; the strength and dignity of manner, with which they are expressed, indicate great delicacy of feeling, and a well-cultivated mind.

Energy of style, polished wit, and well-directed raillery, are highly grateful to the critic, and soothe his toils in pointing out the paths which lead to the dwelling of science; and we have found them in the work, the review of which we have just completed. But these are not the traits with which the merit of it should be depicted: it has a more noble and important character,—that of eminently contributing to improve the art of surgery

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Physiological and Medical Researches on the Causes, Symptoms, and Treatment, of Gravel; by F. MAJENDIE, M. D. &c.

[From the London Medical and Physical Journal, for October, 1818.]

THERE is no disease, for obtaining an accurate knowledge of which, the abilities of the chemist, the physiologist, and the practical physician, are more requisite, than that of calculous concretions in the kidneys and bladder: a work, therefore, on this subject, by M. Majendie, must be considered with no small degree of attention by the medical profession.

"Notwithstanding its frequency, (says the author) the distressing symptoms with which it is accompanied, and its serious consequences, gravel has been but slightly noticed in general works on medicine and surgery: in particular treatises on the diseases of the urinary organs, it is considered in a very imperfect manner; and, to my knowledge, it has not hitherto been the professed subject of a work."*

M. Majendie first treats on the nature of the sand and stones voided by persons affected with this complaint. The knowledge of the composition of those substances is entirely due to the researches of modern physiologists. Van Helmont, notwithstanding his penetrative imagination, could only compare their formation to the deposition of tartar from wine. Paracelsus believed them to be formed of *animal resin* hardened by what he termed the *spirit of urine*. It is to Scheele that we are indebted for the origin of our knowledge on this subject: he shewed that the concretions voided with the urine were principally formed by a particular acid, to which he gave the term *lithic*. The researches of Wollaston, Fourcroy, Vauquelin, Brande, and Marcet, have fully confirmed the discoveries of that illustrious chemist, and have furnished us with the knowledge of many other important facts.

Some species of calculi contain a small proportion of oxalate of lime; and, in a few instances, they are almost entirely formed of oxalate or phosphate of lime. When they remain long in the kidneys, they become covered with a thin layer of phosphate of lime and magnesia. M. Claubry has lately found in the kidney of a man four calculi, each formed of a nucleus of oxalate of lime, and an exterior layer of uric acid. Upwards of thirty specimens of gravel were analysed by M. Majendie, and he found them all composed of uric acid united with a small proportion of animal matter.

The urine of man, he observes, and of all animals, who use a diet of aliments containing a large proportion of azote; as flesh, fish, eggs, &c. contains uric acid; and it is very abundant in that of those who live exclusively on animal food. On the

* Dr. Marcet, in his treatise on Calculous Disorders, has not thought it necessary to separate the history of gravel from that of other calculous formations in the urinary passages.

contrary, in animals who are fed with vegetables, the urine does not contain the smallest quantity of uric acid.

Water, at the temperature of from sixty-five to seventy degrees of Fahrenheit, dissolves only the $\frac{1}{1720}$ part of its weight of uric acid; boiling water dissolves it in the proportion of $\frac{1}{1150}$, and the solution, on cooling, deposits a portion of the acid in thin laminæ. The solubility of the salts formed by uric acid, is relative to that of their bases. Almost all the acids are capable of decomposing them.

The cystic oxide, the author states, very rarely enters into the formation of gravel and urinary calculi; but, as the nature of this animal matter is not generally known, it may be proper to mention its general properties. Calculi formed of cystic oxide, are semi-transparent, of a yellowish colour, and have a lustre similar to that of bodies of a density powerfully refractive. Exposed to heat, in a retort, they furnish carbonate of ammonia of a fetid odour; there passes also an heavy fetid oil, such as is obtained from animal matter, but in a much less proportion than that which results from a distillation of uric acid. These properties show, that, like uric acid, it is principally composed of azote; it is therefore probable, that it is produced by the same causes which determine the formation of uric acid. This substance is but very slightly soluble in water, not at all in alcohol, or the acetic, tartaric, and citric acids; it is, on the contrary, soluble in the muriatic, nitric, sulphuric, phosphoric, and oxalic acids, as well as in potash, soda, lime-water, and the carbonates of potash and soda. The greater number of those properties approach to those of uric acid.

When treating on the causes of gravel, M. Majendie observes; it is evident the formation of uric acid is not accidental, or owing to diseased action, but that it is one of the essential principles of the urine of a person in a state of health: it is then, however, held in solution by the urine; but, in this disease, it is deposited in the passages intended for the collection and evacuation of that fluid. As water, at the temperature of 80°, dissolves the $\frac{1}{1500}$ part of its weight of uric acid; the urine of a person in a state of health, being about 30°, may be supposed capable of retaining in solution about the $\frac{1}{1500}$

part of its weight, supposing, what nothing yet known tends to refute, that the other principles of the urine do not favour its solution. This being granted, it appears that three evident causes may diminish, in a manner absolute or relative, the dissolving property of the urine in respect to the uric acid.

1. An increase in the quantity of the uric acid, the quantity of urine remaining the same, or not increased in proportion to the acid.

2. A diminution in the quantity of the urine, that of the uric acid continuing the same, or not diminishing in proportion to the urine.

3. A diminution of the temperature of the urine, whether its quantity or nature continue the same or undergo the changes above mentioned.

Among the causes which augment the proportion of uric acid, a too nourishing diet, and particularly of animal substances, may be considered the most efficient. When, with this, persons lead a sedentary life, or use exercise which requires but very little exertion of the muscular system, as is the case with literary men, the rich, and old people in general, the disposition to its formation is much increased. As long as the urine is sufficient to hold in solution the uric acid formed, any increase in its quantity is productive of no inconvenience; and this is doubtless what happens to many persons who use the diet just described, and who are not affected with gravel; but, as soon as the increase of the quantity of urine does not proportionally follow that of the acid, gravel is immediately formed.

In general, the proportion of urine is relative to that of the liquids drank; and, therefore, a person who uses a full diet of animal food, will be more likely to escape gravel, if he drink a large, than if he drink a small, quantity. This must be understood, if the fluids he takes be not charged with alcohol.

Animals which live on vegetable food, void a much larger proportion of urine than carnivorous animals, notwithstanding they drink much less. All causes which are known to diminish the quantity of urine will, therefore, favour the formation of gravel; as an abundant cutaneous transpiration, sweats,

and lying much in bed, will consequently tend to produce it. A diminution of animal heat, and consequently of the temperature of the urine, will have the same effect, and this is one reason why old people are so particularly subject to it. Various other causes will also favour its production; it appears from the observations of Dr. Scudamore,* that the poor people of a district between Tunbridge Wells and Lewes, who drink much of "hard beer," are particularly afflicted with it. There are many persons, who, after violent exercise, to which they have not been accustomed, pass large quantities of gravel. It frequently follows indigestion. M. Majendie does not consider the formation of gravel, in these cases, the consequence of indigestion, but that they both arise from the same cause. The author is inclined to attribute the freedom the Indians enjoy from gravel, not to the climate, as some have done, but to their living on vegetable food. The results of the enquiries of Dr. Marcet respecting the relative proportion of patients with stone, in the different hospitals of Europe, favours this opinion. At Guy's Hospital, the proportion is one in three hundred; at St. Bartholomew's, one in three hundred and forty; in the Royal Infirmary at Edinburgh, only one in a thousand. This difference in the proportion between the Scotch and the English, may be explained, by the diet of the poor of the former country being almost entirely of vegetables, while the latter take a large quantity of animal food. The notion that calcareous waters tend to produce gravel is erroneous; they, on the contrary, may be advantageously employed for the relief of this complaint. M. Majendie considers that the causes which tend directly or indirectly to produce the formation of gravel may be reduced to the following:—

1. Mature and old age.
2. A too nutritious diet, principally composed of aliments containing a large proportion of azote.
3. Want of bodily exercise, lying too long in bed, &c.
4. The habit of drinking but little.
5. The use of generous wines and spirituous liquors.

* Related in his Treatise on Gout.

6. Abundant cutaneous transpiration, copious sweats, and serous evacuations, in persons previously disposed to gravel.

7. The bad habit of retaining the urine long in the bladder.

8. Particular causes, of which it is impossible to mistake the effects; although their mode of action may not be understood.

M. Majendie thinks that, under certain circumstances, a large quantity of gravel may be formed in a few hours, the solidification of the uric acid taking place as soon as the urine is secreted. He is not decided where this precipitation of the uric acid principally takes place, but supposes it to be in the pelvises of the kidneys.

Sand, in general, passes without causing much uneasiness, when the secretion of urine is copious; but, when otherwise, particles becoming joined together, form small calculi, which occasion great pain in their passage through the ureters. If any of those become arrested in their progress in the urinary passages, they form a nucleus for the formation of larger stones.

The following are the curative indications in this disease:—

To diminish the quantity of uric acid formed in the kidneys.

To augment the secretion of urine.

To prevent the solidification of the uric acid, by saturating it with a more soluble basis.

Gravel and calculi being formed, to favour their evacuation, and attempt their solution.

The formation of uric acid depending on the use of aliments containing azote, the mode of fulfilling the first indication is obvious; the quantity of animal food, eggs, &c. should be diminished, and, in some instances, entirely changed for a vegetable diet. This will generally correct the disposition to the formation of gravel. M. Majendie has seen cases, in which the patients had been for many years tormented by gravel and small calculi, entirely relieved in a few weeks by the use of a diet of sugar alone: this, however, cannot long be persisted in, as it disagrees with the stomach. A diet composed entirely of pastry, the farinaceous legumens, rice, potatoes, rye-bread, with a moderate proportion of sugar, has, in general, been found equally efficacious.

The most simple mode of increasing the quantity of urine is to drink plentifully; and this is the usual custom of persons afflicted with gravel. Many, by this means, without change of regimen, have been entirely relieved from the disease. The drink may be either simple water or infusion of some vegetable; mineral waters, &c.; sometimes nitre may be added with advantage. Five or six pints of drink daily will not be too large a quantity, particularly if the gravel be abundant. But little wine or spirituous liquors should be taken; and, when the gravel is considerable in quantity, a diet principally of vegetables (which favours a copious secretion of urine) should be employed.

The third indication, *to saturate the uric acid*, is to be effected by the alkalies or their sub-carbonates. That many substances are carried from the stomach to the kidneys, without passing through the general circulation, M. Majendie thinks is sufficiently proved: and of those, some of the saline preparations are most quickly transmitted, and in the most unaltered state. The alkaline sub-carbonates are decomposed in the urine, the uric acid unites with the base, and forms salts more soluble than the acid. This greater degree of solubility is in proportion to the excess of the base: it will, therefore, be necessary to preserve an excess of alkali in the urine, not presenting acid qualities.

The last indication,—*to favour the expulsion of sand and calculi, and attempt their solution*,—is not less, and is indeed frequently more, important, than either of the preceding. The expulsion of sand is usually not attended with much difficulty. The facility with which the particles are displaced, from their smallness, and their property of resting suspended in the urine, provided it contains a little mucus, concur to favour their evacuation: thus, in the greater number of cases, a certain quantity of aqueous drink will effect their evacuation with little difficulty. The expulsion of calculi will also be much favoured by drinking copiously of water. M. Majendie recommends emetics in these cases; considering that the pressure of the abdominal muscles, during the action of vomiting, will contribute much to hasten the passage of the calculi to the bladder and through the urethra. Emetics will also be bene-

ficial by correcting the disordered state of the digestive organs which usually accompanies it. When the distress is very great, the most rigorous diet, general blood-letting, leeches, cupping, baths, and fomentations, are the principal measures to be adopted. If these are not effectual, exercise on foot and on horseback, if the patient can bear it, and the repeated use of emetics, should be resorted to. When it appears that the calculus has entered the bladder, but has not passed through the urethra, the measures before advised to prevent its increase should be employed. When the calculi are composed of uric acid, both chemical and physiological reasoning would lead us to suppose that those measures would be effectual. But this will not be the case when they are formed of the ammoniaco-magnesian phosphate, the oxalate of lime, &c. these, however, but rarely constitute the caculous concretions of patients afflicted with gravel.

Cystic oxide, as it contains a large proportion of azote, probably owes its formation to the causes which produce uric acid; the same remedies will therefore be adviseable.

Acids have been proposed to be employed, in the treatment of gravel, consisting of phosphate of lime; the urine in cases of this kind contains an excess of ammonia, which is probably the principal cause of its production; and Mr. Brande has related a case in which carbonic acid was very beneficial. But M. Majendie could never effect the solution of depositions of this kind, when out of the body, by either the vegetable or mineral acids. He, therefore, thinks the best mode of treatment is to produce an abundant secretion of urine, and endeavour to relieve the distress and debility which usually accompany this disease.

Pathological and Therapeutical Observations on Hæmorrhoids.

"The subject of the present Article is characterised by laborious and patient research, and exhibits all the systematic arrangement and analytical transparency, which are peculiar to the scientific literature of that country." *Sir. T. C. Morgan, in the Edinburgh Journal, No. LIII.*

[From the Medico-Chirurgical Journal for October, 1818.]

In the highly respected cotemporary Journal above mentioned, is given a meagre and imperfect account of an extremely interesting article in the 20th Vol. of the great French work now publishing by some of the most eminent physicians and surgeons of France. We shall here present the English reader with a clear and well defined picture of Dr. Montegre's monograph, convinced that the subject is both ill understood and too much neglected by British physicians. Having been *hæmorrhoidinarians* ourselves for more than twenty-five years, and having paid unusual attention to this complaint, both in our own persons, and in our patients, we may be allowed to be, in some degree, judges of the doctrines and practices brought forward by the continental physicians; consequently, this article is to be regarded, not as a tame translation, but as an eclectic analysis, occasionally interwoven with the personal observations of the translator.

Sect. 1. *Description and Definition.*

The well known Greek definition of hæmorrhoids [sanguifluxus] conveys a most imperfect idea of the disease; since a *discharge of blood*, though a frequent, is by no means a constant symptom. The same may be said of the anal tumours. From the effect of causes which it is often difficult to recognize, there occurs, at certain periods, a sanguineous fluxion or determination (fluxion sanguine; mouvement fluxionnaire) towards the extremity of the rectum; evinced at first by merely a sense of *tension or weight* there, with scarcely any pain, and gradually going off in three or four days. This determination is renewed at longer or shorter intervals; fre-

quently, but not uniformly, accompanied by a discharge of florid blood on going to stool, exhaled, as it were, from the mucous membrane of the intestine, and usually without any visible erosion of structure. After a time, hæmorrhoidal tumours in general appear, merely as a *consequence*, but not as an essential part of the affection. In fact, the sense of *tension and weight* is the only *pathognomonic* mark of the disease; all the others are accessory, or contingent.

In well marked cases of hæmorrhoids, there are certain general or constitutional symptoms, which have been clearly, though concisely, summed up by the venerable Pinel. "Slight horripilation of the back and loins; occasional numbness of the lower extremities; hardness and concentration of the pulse; pallor of the face; dulness of the eyes, with a dark circle round them; dryness of the mouth; scantiness of the urine; gastric debility; intestinal flatulence; frequent inclination to stool and urine; sense of pressure about the anus and perinæum, with an occasional discharge of mucus." *Nosograph. Philosoph.*

It is hardly necessary to remark, that this train of symptoms, which evinces a great fluxionary movement in the system, is sometimes so slight as to evade notice, and is only recognized by the sanguineous discharge.

From this view of the subject, a considerable analogy between the hæmorrhoidal and menstrual flux will at once be perceptible, though the *periodicity* of the latter is much more regular than that of the former. We shall not, however, dwell on this analogy; but we may remark that the connexion between the hæmorrhoidal and *Portal* circulation,* in both sexes, points not only to the *causes*, but to the salutary *effects* of the hæmorrhoidal discharge, in various derangements of the organic balance. When within certain bounds, therefore, it can hardly be called a disease; since without impeding the exercise of any function, or causing any material inconvenience or pain, it tends, like the menstrual flux, towards the conservation of health.

* "Vena Portæ, Porta Malorum." *Stahl.*

Sect. 2. Accessory Phænomena or Complications.

These are commonly hæmorrhages; tubercles and tumours; inflammation; leucorrhœal discharges; *or consecutively*, fissures; excrescences; pains or strictures of the rectum; ulcerations; abscesses; fistulæ; indurations or even scirrhi of the gut; prolapsus ani; inflammation or irritation of the bladder or neighbouring parts. Of these contingent phenomena, we shall only notice one or two.

Hæmorrhage. This is among the first contingencies that supervene on the hæmorrhoidal movement, and is that which has improperly given a name to the affection. The most usual species of hæmorrhage is by a kind of *exudation* or exhalation from the extremities of the capillary vessels of the mucous membrane, in the same manner as from the uterine vessels at the catamenial periods. The blood in these cases is vermilion-coloured, accompanying, but not mixed with the fæcal matters. Sometimes the blood issues by a fine and continued jet, during the straining at stool; and yet, when we examine the parts with glasses, no solution of continuity is to be found, the blood evidently having issued from a dilated pore. Professor Richerand records a remarkable example. "A merchant arrived at his 90th year in perfect health. This long immunity from disease he attributed to an hæmorrhoidal flux which had been regularly established more than fifty years, and so considerable in quantity, that the blood spouted to a certain distance from the anus, as from a vein opened by a lancet." *Nos. Chir.*

Active Hæmorrhage. This is the result of a vital movement, and is always salutary when in moderation. It may, however, prove dangerous when excessive, and lead to *passive* hæmorrhage, which is of a much worse character. The immoderate or inconsiderate use of venesection from the system at large, or application of leeches to the anus itself, frequently determines this excess. The quantity of the hæmorrhoidal discharge varies much, as there are innumerable examples of people losing, from a few drops, to one or even two pounds of blood *daily*, and that for a long time, without any injurious consequences. Montanus knew a hæmorrhoidinarian, who, for

forty-five days in succession, discharged more than two pints of blood *per anum*, daily, and yet he perfectly recovered. Panorola relates the case of a noble Spaniard, who, during four years, passed daily a pint of blood by stool, and yet enjoyed the most perfect health. Boulli notices the case of a tailor, who passed torrents of blood from the hæmorrhoidal vessels, sometimes to the amount of ten pints; yet was he vigorous, and of a sprightly jovial character. Hoffman relates the case of a widow lady, 50 years of age, gross, and a high liver, who, after being harassed with a variety of anomalous symptoms, and particularly lassitudes, languors and faintings, was seized with the hæmorrhoidal flux, and in twenty-four hours lost more than *two gallons and a half* of blood! The symptoms of debility and oppression abovementioned were quickly dissipated, and she gradually recovered health and strength. These examples are sufficient to assure us, that the hæmorrhoidal discharge may be often enormous, without being necessarily fatal or even dangerous.

For the nature of the hæmorrhoidal tumours themselves, we refer to the short extract from the work of Larroque, inserted in this number of the Journal.

Mucous or Serous Hæmorrhoids. These occasionally succeed the sanguineous forms of the disease, especially where much inflammation has attended. They bear a very exact similitude to the leucorrhœal discharges from the uterine vessels, and depend on the same general and local causes. It is something remarkable, that they seldom occur where the sanguineous discharge from the hæmorrhoidal vessels is copious; a circumstance in which they correspond with the whites, which are rarely seen in females who have copious catamenia.

Sect. 3. Classifications and Distinctions.

Dr. Montegre divides hæmorrhoids into two orders: the regular or periodical; the anomalous or irregular. The *first* are generally constitutional, and not to be cured but at some risk. Such for instance as alternate with or succeed the catamenial discharge. The *anomalous* order are usually dependent on accidental circumstances, and the removal of

their *causes* is the proper method of cure. These two orders are divided by our author into eight species, comprehending numerous varieties. We shall briefly glance at the Species. 1. The dry hæmorrhoids (cæcæ.) These offer the genuine hæmorrhoidal movement or determination to the rectum before alluded to, and have no varieties. 2d Species. The H. fluentes, with two varieties; the sanguineous and mucous. 3d Species. H. tumentes, with two varieties; the varicosæ and the mariscæ. 4th Species. H. dolentes, with three varieties; the inflammatoriæ, nervosæ, and H. cum fissuris. 5th Species. H. cum contractione ani. 6th Species. H. cum ulceratione. 7th Species. H. cum procidentia ani. 8th Species. H. cum irritatione vesicæ urinariæ.

We do not mean to follow our author through these orders, species, and varieties; but we think the classification a useful and natural one for any author or lecturer who treats fully and distinctly on the subject. No one can deny that these *modifications* of the disease actually present themselves in practice, and moreover that they require a corresponding *modification* of treatment and attention. They are not therefore *useless* distinctions, as the indolent would fain represent them.

Sect. 4. *Etiology.*

1. Hereditary predisposition. 2. Climate. 3. Age. 4. Sex. 5. Habits of life. 6. Season and temperature. 8. Food. 9. Constipation. 10. The labours of the cabinet. 11. Depressing passions. 12. Certain diseases. 13. Pregnancy. 14. Tight clothes round the abdomen. 15. The abuse of drastic purgatives. 16. Too frequent use of glysters. 17. Venery. 18. External irritation. 19. The use of hollow night stools.

On each of these points Dr. Montegre descants with great acuteness and knowledge of the subject, and we regret that our limits forbid our following him.

We have so invariably found strong mental emotions of a *melancholy nature* to induce the hæmorrhoidal movement in our own persons, and have so often observed the same in others, that we can confirm the statements of our author on this head.

"Anger, fear, ennui, disquiet, and habitual melancholy,

says Dr. Montegre, exert a remarkable influence on the *cœliac plexus*, situated in the abdomen, and in immediate sympathetic communication with the liver, biliary ducts, and the whole system of vessels that return the blood from the rectum. This impression is most felt at the epigastrium by a sense of uneasiness, load, and kind of constriction there, producing derangement of the digestion, and biliary secretion, gastric irritability, &c. The effect of these melancholy emotions is to unhinge the balance of the circulation, and give origin to internal concentrations of blood. The cutaneous vessels become almost exsanguious, and it is under such circumstances that we see rupture of the parietes of the heart, or fatal congestions in some of the other viscera. Here an explosion of the hæmorrhoidal flux may often ward off the impending danger."

Under the head of *medicinal causes* of hæmorrhoids, Dr. Montegre enumerates the frequent use of aloes, rhubarb, neutral salts [on the authority of Hildebrandt,] emmenagogues, certain mineral waters, glysters, &c.

Miscellaneous Causes. Long and fatiguing marches on foot; *violent* horse exercise [gentle horse excercise is one of the most powerful anti-hæmorrhoidal measures] sudden impression of heat or cold on the region of the fundament; the too frequent application of leeches to the anus; the inordinate use of foot baths; [and we may add of biddies]; the use of hollow seats [usage d'un siege perce]; and lastly, according to the opinion of De Haen, the effluvia from privies while seated at stool.

Sect. 5. Prognosis.

In this section Dr. Montegre enters deeply into the argument that, speaking generally, hæmorrhoids are salutary efforts of the constitution, although they may often, like many other sanative processes, prove injurious, or even fatal. Attentive observation will show that, in the present state of society, almost every individual of the human race has some one organ or part of the body more weak, more irritable, or more predisposed to disease than the rest; and that this part is usually an important viscus of vital function. This con-

sideration will induce the pathologist to acknowledge, that the hæmorrhoidal movement and discharge are, upon the whole, productive of salutary effects, as determining this irritation or local plethora to a part where it may be expended with safety, though with inconvenience or pain.

Let us apply this reasoning. M. Bayle and others have shown, that pulmonary consumption carries off a fifth part of the human species. Without entering into a disquisition on the nature of phthisis, it will be very generally allowed, that it consists essentially and originally in a *sanguineous determination* to the respiratory apparatus, however slow or insidious its progress. Now, granting that the causes, whatever they may be, which induce such a wide wasting disease, are operating with more or less intensity on all classes, we have strong reasons for believing that the hæmorrhoidal movement preserves, in a considerable number of cases, the lungs from the disorganizing irritation of phthisis. This reasoning is strongly supported by the well known connexion which subsists between pulmonary consumption and fistula in ano, the latter almost constantly arresting the progress of the former; and on the contrary, very often giving origin to the pulmonic affection when suddenly cured in unsound constitutions. If, then, a *fistula in ano*, which acts like a perpetual hæmorrhoidal drain, can arrest the progress of phthisis, after it has actually been developed, as every observant practitioner must have repeatedly seen, how much reason have we to expect that an establishment of the hæmorrhoidal flux, *anterior* to phthisis, may, in many cases, avert it entirely?

The following case from Larroque may come in here as illustrative of the subject.

"A lady, previous to puberty, had all the symptoms of pulmonary consumption; but as soon as the menses were established, these symptoms disappeared, although several distinguished physicians had pronounced the case incurable. From this time till the cessation of the menstrual discharge, at the age of 45, no complaint of the chest was manifest; but at the turn of life the symptoms of phthisis were again renewed. Fortunately, at this epoch the hæmorrhoidal flux appeared, and the thoracic affection instantly gave way. Between the

age of 60 and 70, the hæmorrhoidal discharge ceased, and again returned the cough and expectoration, of which she died."

The following case, communicated to Dr. Montegre by Dr. Bodson, exhibits another example of the salutary effects of the hæmorrhoidal flux, where there is reason to fear that an important organ is on the eve of structural tension.

A man, 25 years of age, married two years, tall and thin, became affected with constant and severe pain between the shoulders, accompanied by cough and copious expectoration, emaciation, and progressively increasing debility. Notwithstanding various means, these symptoms got worse and worse, and the young man was considered to be in a confirmed consumption. The attending physician happening to recollect that the father of the patient had been hæmorrhoidinary, conceived that the establishment of such an affection might be serviceable to the son, and consequently applied six leeches to the fundament. The effect was so rapid and decisive, that it appeared as though the pulmonary disease was destroyed by a single blow. The hæmorrhoidal movement became irregularly established, he recovered flesh and strength, and continued in good health."

Indeed, since the days of Hippocrates, hæmorrhoids have been considered by accurate observers to have an antiphthisical tendency. The Father of physic distinctly says,— "*Qui sanguinem per ora venarum, quæ sunt in ano, perfundere solent, ii neque lateris dolore neque pulmonis inflammatione corripiuntur.*" *De Humor.*

From all these considerations, then, would it not be a useful indication to endeavour to establish the hæmorrhoidal discharge by aloetics, leeches, &c. in those who are predisposed to phthisical disorders in this country?

Sect. 6. *Retention and Suppression of Hæmorrhoids.*

The *causes* of these accidents may be divided into preparatory and efficient. Among the first order we may reckon the nervous temperament, great sensibility, a predisposition to morbid action in some internal organ or part, as the bladder, kidneys, liver, stomach, lungs, heart, or great vessels.

The *efficient* causes of retention are very numerous. The principal are, high inflammatory action in the system, excessive hæmorrhages, violent mental commotions, as terror, anger, &c.; the application of inordinate heat or cold to the parts; wet and cold to the feet; baths too hot or too cold, taken during the paroxysm; aliments very high seasoned or stimulating; inordinate evacuations, whether from the vascular, lymphatic, or glandular systems, as profuse venesection, great sweats, salivation, hypercatharsis, &c.; the application of irritating or astringent substances to the hæmorrhoidal tumours.

Consequences of Retention and Suppression. It must be borne in mind, that the most sudden and abrupt suppression of a long established hæmorrhoidal flux, whether by accident or by topical remedies, will, in very many cases, be followed by no inconvenience, and the patient may enjoy many years of perfect health, and immunity from the original affection. In illustration of this position we could relate numerous facts, but shall confine ourselves to one or two instances.

Case 1. "A gentlemen, 34 years of age, very robust, of a bilio-sanguine temperament, born of hæmorrhoidinary parents, and long afflicted with most violent paroxysms of the complaint, sometimes accompanied with sanguineous discharge, sometimes not, observed, that the intervals of health were always long, in proportion to the force and duration of the preceding attack. After an unusually severe hæmorrhoidal paroxysm, which was procrastinated six months, and attended with great pain, he was suddenly cured by a topical application. He has now continued five years free from hæmorrhoids and all other complaints, although he leads the same kind of sedentary life as before, and often keeps late hours."

Case 2. "My father, then 22 years of age, happening to be travelling in Italy, was afflicted several months with the most excruciatingly painful hæmorrhoids, accompanied by a sanguineous discharge and external tumours. He was cured in one night by an empirical application at Venice, and never afterwards experienced any hæmorrhoidal affection. He died of an apoplexy at the age of 78."

The prognosis, then, in cases of sudden suppression of the

hæmorrhoidal movement, must be founded on the nature and importance of the effects which follow. The suppression will be more dangerous in proportion as the individual is predisposed to any visceral affection, as phthisis, cardiac disease, aneurism of any of the large vessels, &c. Advanced age, and the turn of life in females are unfavourable epochs for such accidents.

But although immunity from disease frequently follows a suppression of the hæmorrhoids, we are by no means to calculate on such good fortune as even generally to be met with. We shall here then present a rapid sketch of the various phænomena which attentive observation has ascertained, as very frequently resulting from the suppression or retention under consideration.

1. *Fever* has, in many instances, been kindled up by the suppression of the hæmorrhoidal flux. Ludolph relates a remarkable instance:—A man of letters, 40 years of age, thin, yet plethoric, of sedentary habits, had frequently experienced the hæmorrhoidal discharge with advantage to his general health. But this discharge having become excessive, his physician suddenly suppressed it; the consequence of which was pains and sense of anguish at the præcordia, acute fever, violent delirium, and death in a few days! Stahl offers us nearly a similar example.

2. *Phlegmasiæ.* The brain or its meninges, the lungs or their coverings, the heart, the stomach, the liver, and peritoneum, are often affected with inflammation from suppressed hæmorrhoids. But chronic engorgements, with gradual induration of these viscera, are the more usual results.

3. *Hæmorrhages.* Almost every part of the body may become the seat of hæmorrhage, *vicarious* of the hæmorrhoidal flux when suppressed; but more especially the uterus, the bladder, the stomach, the liver, and the lungs.

4. *The Neuroses.* Esquirol asserts, that melancholy and insanity frequently result from the suppression of hæmorrhoidal evacuations; Poissonier, Andry, &c. saw tetanus result from the same; Heister, hypochondriacism; and, according to Dion Cassius, the Emperor Trajan experienced an attack of apoplexy, followed by hemiplegia, in consequence of a sudden

suppression of the hæmorrhoidal flux, to which he had been long subject. He soon afterwards became dropsical and died.

Sect. 7. Treatment.

1. *The Hæmorrhage.* This accident demands our attention, since its *excess* may prove dangerous or even fatal, and yet its continuance may be necessary to the constitution. As long as the flow of blood returns periodically, with considerable intervals, and without apparently injuring the health, we should be cautious how we arrest the discharge; but when it produces sudden debility, paleness, or spasms, we should endeavour to moderate the flow. It is certain, however, that the most excessive hæmorrhage in this way is rarely fatal in itself, though it may prove so consecutively. It has been justly observed, too, that the greatest hæmorrhage is often less dangerous than the means which we take to arrest it.

These means should first be *general* rather than local. The patient should be laid on a cool bed in the middle of an airy room, with few or no bed clothes, and kept in the most perfect quietude in the horizontal position, his feet a little raised; if he can lie on his face, so much the better. These precautions, with cold acidulated drink, will commonly *moderate* the discharge, which is better than suddenly checking it. If these means are unsuccessful, we must endeavour to induce a determination to some other quarter, by venesection, by cupping glasses to the shoulders, by ligatures to the upper extremities, as practised by Galen, and too much neglected by the moderns; by long continued frictions, with flesh brushes, to the upper parts of the body, especially in the latter or passive stage of the hæmorrhage. On the same principle of counter-derivation, we apply sinapisms to the inside of each arm. When these means fail, we must have recourse to *local* applications, such as cold, astringents, or plugging the rectum.

The ancients were in the habit of applying the actual cautery, and Montegre recommends the same as a last resource.

2. *The Tumours.* The great art in the treatment of hæmorrhoidal tumours is *compression.* We can assert, from personal

experience, that however large these bodies may project at stool, or at other times; if the patient lies down on his back, and makes gradual but constant pressure with his fingers, they will be almost always got within the sphincter ani, and by a T bandage well secured, with a small pad on the anus, they may be prevented from prolapsing.

The extirpation of hæmorrhoidal tumours by the knife or ligature, need not to be touched upon in this place.

3. *Hæmorrhoidal Inflammation.* If no sinister accident take place, the hæmorrhoidal inflammation commonly runs a course of six or eight days, with considerable intensity, when the tumours begin to subside, especially if a discharge of blood occurs, re-enter the anal sphincter, and the pains vanish entirely.

To moderate the inflammation of hæmorrhoidal tumours, the application of leeches to the parts is a very general practice. Dr. Montegre reprobates this remedy, and certainly we have not experienced that advantage from this mode of local bleeding that we expected. Dr. M. asserts, that instead of unloading the gorged vessels, "the effect is quite contrary—the determination of blood to the part is augmented considerably, together with all the consequences of this determination." *L'effet en est ordinairement tout contraire; la fluxion est presque toujours considerablemént augmente, &c.* To the *loins* he advises the leeches to be applied, where they will have the effect of degorging locally, without producing irritation by their bites.

The application of cupping glasses, with or without scarification to the shoulders, or hypochondria, are recommended as very useful derivatives in excessive hæmorrhoidal discharges. Warm fomentation or half-baths, though popular, are in general hurtful remedies. M. Recamier has seen the tumours become gangrenous from their use.

We have, ourselves, however, seen very good effects from emollient cataplasms in painful hæmorrhoidal swellings, that could not be pressed within the sphincter ani.

While these means are used, the patient should take mild cooling laxatives internally, as supertartrite of potash, tamarinds, manna, sulphur, &c. with cool diluting drinks.

4. *Hæmorrhoidal Pains.* Dr. Montegre calls the attention of the Faculty to the use of injections of cold water, or water with the chill off it, together with semicupia of the same, in those hæmorrhoidal pains attending the fæcal evacuation, accompanied or not with inflammation, which are so distressing to many people. He considers this remedy as, by far, superior to every other, while it is totally devoid of danger or inconvenience. We think this hint worth attending to.

5. *Equitation.* Although violent horse excercise will often occasion hæmorrhoids in those who are not accustomed to ride, yet there is not a more powerful remedial measure, when moderately used, than this. Indeed, no man need suffer from the piles who can keep a horse.

7. *Hæmorrhoidal Colic.* As this is occasioned by a determination of blood to the mesenteric vessels, there is no more speedy means of relief than by establishing the hæmorrhoidal discharge, by the application of leeches to the anus, warm emollient glysters, and purgatives.

8. *Constipation.* This is not only a very frequent cause of hæmorrhoids, but it is an accompaniment which renders the complaint one of the most painful afflictions of human nature.

General Remedies. Every thing which augments the cutaneous transpiration, and increases the activity of the absorbents of the intestinal canal; or, on the other hand, diminishes the secretory office of the mucous membrane of the intestines, tends to constipation. Hæmorrhoidinarians, therefore, ought to avoid all violent and unaccustomed exercises which cause much perspiration, as also hot and vapour baths. The diet, must, of course, vary according to the idiosyncracy of the patient.

Of laxative medicines, the best are the tartrite of potash with sulphur and supertartrite of potash in molassess, as an electurary at night. But *injections of cold water* are, of all other remedies, by far the most efficacious. These injections should be small in quantity, not more than sufficient to fill the rectum.

In respect to the constitutional treatment of the hæmorrhoidal movement itself, it is needless to observe, that as our author considers this movement a salutary one, he rarely ad-

vises any means of counteracting it. On the contrary, where phthisis, apoplexy, or any organic disease of an internal viscus threatens the patient, D. M. thinks that a hæmorrhoidal discharge ought to be induced, or renewed, if suppressed.

We shall conclude this paper by an abstract of Dr. Montegre's

General rules of conduct for the Hæmorrhoidinarian.

A. A temperate climate agrees best with the hæmorrhoidinary constitution. Too much heat stimulates the biliary system, weakens the digestive organs, and tends to constipation, by rendering the perspiration inordinate. A very cold climate, especially if moist, is also unfavourable to this complaint. Apartments heated and close, and transitions from thence to the cold air, ought to be particularly avoided.

B. The tepid, but not the hot bath, ought to form a part of hæmorrhoidinary regimen. In the intervals of the attack, the *cold* bath is extremely serviceable.

C. The local application of cold water to the fundament, every day, by means of a sponge, especially after going to stool, and when the tumours come out during the alvine evacuations, ought never to be neglected by the hæmorrhoidinarian.

D. The *clothing* should be such as is suitable in rheumatic complaints. Flannels next the skin, so as to favour the insensible perspiration, and defend the patient from abrupt atmospherical transitions, are necessary articles of dress. The bedding should be neither too soft nor too warm; and the hæmorrhoidinarian should avoid sitting on a seat that is either very damp and cold, or heated by the rays of the sun.

E. The *food* should not partake much of the hot, spicy, or stimulating; and the drink should be as aqueous as possible.

F. *Exercise.* Of all exercise, that of riding on horse-back is best. The swing is also useful.

G. "*L'acte venerien* est evidemment utile aux hemorrhoidaires à moins qu'il ne soit repètè d'une maniere excessive, ce qui incommode tout le monde."

H. The moral affections have a great and predominant in-

fluence on the hæmorrhoidal state. They ought, therefore, to be attended to as much as possible, and kept in due bounds, though this is seldom within our power.

We have thus condensed the more important features of this long and interesting article in the French work; and we trust that we have, in so doing, rendered a service to the British medical reader.

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1. *Observations on the Geology of the United States of America.* By WILLIAM MACLURE. Philadelphia, 1817. 8vo. pp. 127.
2. *An Elementary Treatise on Mineralogy and Geology.* By PARKER CLEAVELAND, Professor of Mathematics and Natural Philosophy, and Lecturer on Chemistry and Mineralogy, in Bowdoin College. Boston, 1816. 8vo. pp. 668.

[From the Edinburgh Review, for September 1818.]

IN a former number,* we gave an account of a new Mineralogical Journal, published in America by Dr. Bruce of New York. We hailed the appearance of this work as a proof of the atttention that had been excited to this interesting branch of science, in a field so sure to yield an abundant harvest; and it was with regret that we learned, that a Journal which promised so well at its outset, had very soon been discontinued.

We have now great pleasure in introducing to the notice of our readers, two very excellent publications, which abundantly prove, that the study of Mineralogy is pursued with no less eagerness and success in the United States, than it has been for some years past in most of the countries of Europe. There is not perhaps any department of Science which, at the present time, merits a greater degree of attention in that great and prosperous country, from its various practical applications to some of the most important sources of national wealth and power;

* Vol. xvii. p. 114.

and the more especially that, from the limited researches already made, Nature appears to have added, in abundance, some of her most valuable mineral productions to the other internal resources which she has lavished in that part of the world.

The geological part of Mr. Maclure's book was first published in the sixth volume of the American Philosophical Transactions; in the present edition there are some additions and corrections, besides two new chapters, which the author informs us in his Preface, are 'an attempt to apply Geology to Agriculture, in showing the probable effects the decomposition of the different classes of rocks may have on the nature and fertility of soils. It is the result of many observations made in Europe and America, and may perhaps be found more useful in the United States than in Europe, as more of the land is in a state of nature not yet changed by the industry of man.'

Mr. Maclure appears to be very thoroughly conversant with his subject, and to have studied with great attention the geological structure of a considerable part of Europe. He is a disciple of Werner; but we recognise him as such, more by the descriptive language he employs, than by his theoretical opinions. His general views are much more enlarged and philosophical, than is usually met with in the geologists of that school; and, like most of those who have had opportunities of extensive observation, he has found that the theory of the Freyberg professor is of a very limited application. The following remarks in his Preface are a sufficient proof that his geological creed is not that of Werner.

"In all speculations on the origin, or agents that have produced the changes on this globe, it is probable that we ought to keep within the boundaries of the probable effects resulting from the regular operations of the great laws of nature, which our experience and observation have brought within the sphere of our knowledge. When we overleap those limits, and suppose a total change in Nature's laws, we embark on the sea of uncertainty, where one conjecture is perhaps as probable as another; for none of them can have any support, or derive any authority from the practical facts wherewith our experience has brought us acquainted."

While we acknowledge the valuable information which this

little work conveys, we cannot bestow any praise on the manner in which the materials are put together. There is a great want of method and arrrangement; for, although the author has laid down a very good plan, he has not adhered to it, but has mixed up one part of his subject with another, so as to cause considerable confusion; and were it not for the accompanying coloured map, it would often be very difficult to comprehend his descriptions. In attempting to give a sketch of the contents of the book, as we cannot afford the same assistance to our readers, we shall not follow the author in these deviations, but preserve the order in which it appears to have been his original intention that his observations should be set down.

Along the eastern side of the Continent of North America, there runs an extensive range of mountains, generally called the Alleghany, in a direction nearly NE. and SW. between the rivers St. Lawrence and Mississippi. The most elevated parts of the range are in the North-eastern States: the White Hills in New-Hampshire appear to be the most lofty, and their height is somewhat more than 6000 feet above the level of the sea. The most elevated parts, as well as the greatest mass of this range consist of primitive rocks; but, as it approaches the Hudson river, and where it traverses the State of New-Jersey, these rocks decrease in height and breadth. In Pennsylvania and Maryland, the primitive rocks occur sparingly, the highest parts of the range consisting of transition rocks, with some intervening valleys of secondary. In Virginia, the primitive rocks increase in breadth and in height; and they form the greatest mass, as well as the most elevated points, of the range of mountains in the States of North Carolina and Georgia, where it takes a more westerly direction.

"Besides this great range, there is an extensive district, occupied by primitive rocks on the west side of Lake Champlain, having that Lake, and Lake George for a boundary on the east, joining the primitive rocks in Canada to the north and north west, and following a line from the Thousand Islands in the St. Lawrence, running nearly parallel to the Mohawk river, until it meets Lake George on the south west These primitive rocks run across the Mohawk at the Little Falls, and near Johnstown on the Mohawk, where they are covered by lime-

stone; they occupy all the mountainous country between Lake Champlain, the St. Lawrence, and Lake Ontario." p. 38.

"From near Kingston on Lake Ontario, to some distance below Quebec, the country is principally primitive; and, from all information I could collect, that great mass of continent lying to the north of the 46th degree of latitude, for a considerable distance to the west, consists mostly of the same formation: from which it is probable, that on this continent, as well as in Europe and Asia, the Northern regions are principally occupied by the primitive formation." p. 58.

Throughout the greatest part of the northern and north-eastern States, the sea washes the primary rocks; but at Long Island there commences an alluvial formation, which, increasing in breadth as it stretches southward, covers a great part of both the Carolinas and Georgia, and almost the whole of the two Floridas and Lower Louisiana. This vast alluvial formation is bounded on the east by the ocean, and by a line commencing at the eastern end of Long Island and passing through Philadelphia, Washington, Richmond in Virginia, Halifax in North Carolina, Columbia in South Carolina, Augusta on the Savannah, and thence to Natchez on the Mississippi. The tide water ends in all the rivers from the Mississippi to the Roanoke at the distance of from thirty to 120 miles from the western limits of the alluvial formation; from the Roanoke to the Delaware, the tide penetrates through the alluvial, and is stopped by the primitive rocks. In all the northern and eastern rivers, the tide runs a small distance into the primitive formations. In the Southern States the alluvial formation is elevated considerably above the level of the sea; but as it approaches the north, it rises very little above it.

On the western side of the great range of mountains, there is a long narrow zone of transition rocks, beginning on the eastern side of Lake Champlain, and extending in an undulatting line in a south-westerly direction, to a point between the Alabama and Tombigbee rivers, in latitude about 34 N. and longitude about 85 W. It is generally broadest where the primitive formation is narrowest, and *vice versa;* and runs from twenty to a hundred miles in breadth.

On the north-west of those transition rocks commences an

immense region of secondary rocks, extending beyond Lake Superior to the north, and some hundred miles beyond the Mississippi to the west, not far distant from the foot of the Stony Mountains, forming an area of about fifteen hundred miles from east to west, and about twelve hundred miles from north to south.

The Volcanic Fires which constitute so grand a feature in the Geological History of South America, have not extended their dominion to the northern continent, nor have any productions been discovered which indicate that volcanoes have at any time existed there.

The direction of the stratification in the primitive rocks runs nearly north and south, eastward of the state of New-York, with an eastern dip. In the State of New-York and to the south and west, the stratification runs nearly NE. and SW., the dip still continuing to the east. The dip is generally at a greater angle than 45°, and sometimes the strata are almost vertical. The direction of the strata in the transition rocks is also from north and south to north-east and south-west, dipping generally to the north-west, at an angle in most places under 45°. On the edge of the primitive rocks, there is a deviation in some places from this general rule; the dip being, for a short distance, to the south-east. The outline of the mountains of this formation is almost a straight line, with few interruptions, bounding long parallel ridges of nearly the same height, declining gently towards the side where the stratification dips from the horizon, and more precipitous on the opposite side where the edge of the stratum breaks out to the day.

Of the primitive rocks Granite forms but a small part; but it is found both on the tops of the mountains and in the plains. There are many varieties of it, in regard to the size of its constituent parts; and it is occasionally mixed with hornblende. This latter variety, by some geologists, would be called a Sienite; but its geological position is the same as the compound of quartz felspar and mica, which, by the same geologists, is considered as the only true primitive granite. In mentioning this variety, Mr. Maclure remarks, that

"The rounded globules of felspar and hornblende found in

the great masses of granite of the Alps, in Cornwall and in this country, could not be distinguished, in hand specimens, from the Sienite of Werner, though the one is placed in the Wernerian system as the oldest, and the other among the newest of the primitive rocks."

The granite generally divides into rhomboidal masses, and, except in some very small-grained varieties, there is no appearance of stratification. It is frequently so far decomposed as to have lost the adhesion of its particles, to the depth of 30 or 40 feet below the surface; each crystal is in its place, and looks as if it were solid; but when you take it up, it falls into sand.

Gneiss extends over a half of the primitive formation. It includes in a great many places beds from three to three hundred feet thick, of a very large-grained granite, which run in the same direction, and dip as the gneiss does. These beds are mixed, and alternate occasionally in the same gneiss, with primitive limestone, beds of hornblende and hornblende slate, serpentine, felspar rocks, and magnetic iron ore. In some places the gneiss contains so much mica as to run into mica slate; in others, large nodules of quartz or felspar, and, in others, hornblende takes the place of mica.

"Though the primitive formation contains all the variety of primitive rocks found in the mountains of Europe, yet neither their relative situation in the order of succession, nor their relative heights in the range of mountains, correspond with what has been observed in Europe. The order of succession from the Clay slate to the Granite, as well as the gradual diminishing height of the strata, from the granite through the gneiss, mica slate, hornblende rocks, down to to the clay slate, is often so inverted and mixed, as to render the arrangement of any regular series impracticable." p. 16.

Within the limits of what may be termed the primitive country, there are found several partial and detached formations of the transition and secondary rocks. A transition formation occupies nearly the whole of Rhode Island, and runs from Rhode Island to Boston, fifteen miles broad. There is a range of secondary rocks, extending, with some intervals, from the Connecticut to the Rappahannock rivers, a distance of near-

ly four hundred miles; and in width, generally from 15 to 25 miles. It appears to belong to the old red sandstone formation of Werner. A formation of transition rocks runs nearly southwest from the Delaware to the Yadkin river, from two to fifteen miles broad, consisting of beds of blue, grey, red, and white small-grained limestone, alternating with beds of greywacke and greywacke slate, quartzose granular rocks, and a great variety of the transition class. Much of this limestone contains so much small grained sand, as to resemble a dolomite; and, in many places, considerable beds of fine grained white marble, fit for the statuary, occur. About ten or twelve miles west of Richmond in Virginia, there is a coal formation, lying upon, and surrounded by primitive rocks. It is situated in an oblong basin, from twenty to twenty-five miles long, and about ten miles wide, having the whitish freestone, slaty clay, &c. with vegetable impressions, as well as most of the other attendants of that formation.

Great varieties of mineral substances are found in the primitive formation; and, from the number already found, in proportion to the limited researches that have been made, it is probable, that, in so great an extent of rocks of a crystalline structure, almost every mineral substance discovered in similar situations elsewhere, will be found in this country. Metallic substances are found in considerable abundance in the primitive rocks—iron, copper, manganese and cobalt. The general nature of metallic repositories in this formation appears to be in beds, disseminated through the rock, or in lying masses. Veins to any great extent have not been discovered in any part of this formation.

"The transition rocks consist of a small-grained limestone, of all the shades of colour, from white to dark blue, in some places intimately mixed with strata of greywacke-slate; lime spar in veins and disseminated; in many places an intermixture of small-grained particles, so as to put on the appearance of a sandstone, with excess of lime cement. This occurs in beds from fifty to five thousand feet in width, alternating with greywacke and greywacke-slate. Near the borders of the primitive is found a siliceous aggregate, having particles of a light blue colour, from the size of a pin's head to an egg, dis-

seminated in some places in a cement of a slaty texture, and in others in a quartzose cement; a fine sandstone, cemented with quartz in large masses, often of a slaty texture, with small detached scales of mica intervening; a rock not far from the borders of the primitive, partaking both of the porphyry and the greywacke, having both felspar crystals and rounded pebbles in it, with a cement of a kind of dull chlorite slate in excess; another, though rarer, with pebbles and felspar crystals, in a compact petrosiliceous cement, and a great variety of other rocks, which, from their composition and situation, cannot be classed but with the transition.

"The limestone, greywacke, and greywacke-slate, generally occupy the valleys, and the quartzy aggregrates the ridges. There are many and extensive caves in the limestone, where the bones of various animals are found.

"Beds of coal blende, or anthracite, accompanied by alum slate and black chalk, have been discovered in this formation, on Rhode Island, the Lehigh and Susquehannah rivers, and a large body of alum slate on Jackson's river, Virginia; many powerful veins of the sulphate of barytes cross it in different places."—"Iron and lead have as yet been the principal metals found in this formation; the lead in the form of Galena, in clusters, or what the Germans call *Stockwerk*, as at the lead mines on New river, Wythe county, Virginia; the iron disseminated in pyrites, hematitic and magnetic iron; or in beds; and considerable quantities of the sparry iron ore in beds, and disseminated in the limestone." p. 51.

The immense basin to the west of the Alleghany mountains, through which so many mighty rivers flow, is wholly composed of secondary rocks, without having their continuity interrupted by any other formation, except the alluvial deposites on the banks of the large rivers. The stratification is almost perfectly horizontal.

"Immense beds of limestone, of all the shades, from a light blue to a black, intercepted in some places by extensive tracts of sandstone, and other secondary aggregates, appear to constitute the foundation of this formation, on which reposes the great and valuable coal formation, which extends from the head waters of the Ohio in Pennsylvania, with some interrup-

tion, all the way to the waters of the Tombigbee, accompanied by the usual attendants, slaty clay and freestone, with vegetable impressions, &c.; but, in no instance that I have seen or heard of, covered by, or alternating with, any rock resembling basalt; or indeed any of those called the newest floetz trap formation.

"The limestone of this formation contains irregular pieces in nodules and bands, of a kind of black flint (like what is called *Chert* in England), scattered in all forms and directions, often resembling the limestone in colour, in which case it is with difficulty they can be distinguished; they abound on the banks of Lake Erie, on the banks of St. Lawrence, whence it runs from Lake Erie, and, generally through the whole stratification of Limestone.

"Along the south-east boundaries, not far from the transition, a rock salt and gypsum formation has been found. On the north fork of the Holstein river, not far from Abingdon, Virginia, and on the same line south-west from that, in Greene county and Pigeon river, state of Tennessee, it is said quantities of gypsum have been discovered; from which, and the quantities of salt licks and salt springs found in the same range, so far north as Lake Oneida, there is some probability that this formation is upon the same great scale that almost all the other formations have been found on this continent,—at least rational analogy supports the supposition; and we may hope one day to find an abundance of those two most useful substances, which are generally found mixed, or near each other, in all countries that have hitherto been carefully examined." p. 35.

"There are a great many detached masses of granite and sienite, scattered over the surface of that part of the basin which lies to the north of the Ohio river, but runs to the south; from which it is probable that they have come from the north, perhaps from the primitive mountains north of the great lakes." p. 120.

The alluvial country, eastward of the Alleghany mountains, is composed of beds of sand, gravel and clay, differing in their nature, according to that of the adjoining rocks, from the disintegration of which they have been produced. They contain

both animal and vegetable remains, which are found to the depth of nearly a hundred feet below the surface. Considerable banks of shells, mostly bivalves, run parallel to the coast, imbedded frequently in a soft clay or mud, resembling that in which the living animal is now found on the sea shore, and which makes the supposition probable that they are of the same species.

"There is also a bank of shell limestone beginning in North Carolina, parallel to, and within the distance of from twenty to thirty miles of the edge of the primitive, through South Carolina, Georgia, and part of the Mississippi territory. In some places this bank is soft, with a large proportion of clay; in others hard, with a sufficiency of the calcareous matter to be burnt for lime. Large fields of the same formation are found near Cape Florida, and extending some distance along the coast of the bay of Mexico. In some places the calcareous matter of the shells has been washed away, and a deposite of silicious flint, in which they were imbedded, is left, forming a porous flinty rock, which is used with advantage for millstones.

"In the alluvial of New-Jersey, about ten or twenty feet under the surface, there is a kind of greenish blue marl, which they use as manure, in which they find shells, as the Ammonite, Belemnite, Ovulite, Cama, Ostrea, Terebratula, &c. Most of these shells are similar to those found in the limestone and greywacke of the transition, and equally resemble those found in such abundance in the secondary horizontal limestone and sandstone; from which it would follow, that the different classes of rocks on the Continent cannot be distinguished by their shells, though the different strata of the same class may be discovered and known by the arrangement of the shells found in them.

"Considerable deposites of bog iron ore occupy the lower situations; and many of the more elevated and dividing ridges between the rivers are crowned with a sandstone and puddingstone, the cement of which is bog iron ore."

From the interesting and instructive sketch which Mr. Maclure has given of the Geology of so large a portion of the Continent of North America, we obtain an important addition to the evidence we already possess in proof of the uniformity

of structure which seems to prevail over the whole surface of our globe. No new formation has been discovered, nor any predominant rock which this experienced geologist has had any difficulty in recognising as identical with what he had seen in every part of the Continent of Europe. There are, however, two remarkable peculiarities in the country our author has described, which distinguish it from any other of the same extent with which we are acquainted. These are, the very rare occurrence of the trap-rocks and porphyries, and the great extent to which the same series of rocks stretch, without undergoing any change in the uniformity of their composition, and without any disturbance in the regularity of their stratification. When we combine this undisturbed state of the strata with the absence of a class of rocks which are almost invariably accompanied, in other countries, by a dislocation and confusion of the adjoining strata, it must be considered an argument of considerable weight in support of that theory of the origin of the trap-rocks, which supposes them to have been ejected from below, and to have broken up and insinuated themselves among the superincumbent strata. But this is a point of theory supported by so great a body of evidence, that we presume there is now no geologist so bigoted to the aqueous creed as to refuse his assent to it.

The Elementary Treatise of Mr. Cleaveland is a work of considerable merit. He has derived his materials, as he informs us, chiefly from the works of Hauy, Brochant, Brongniart, Lucas, Kirwan, and Jameson; but he has adopted Brongniart as his model; and, in doing so, we think he has followed the most judicious and most useful of all the mineralogical writers who have preceded him. We entirely concur in the following remarks on the Treatise of Brongniart by the author in his Preface.

"Many of the writers of the French and German schools appear to have indulged an undue attachment to their favourite and peculiar system, and have hereby been prevented from receiving mutual benefit; the one being unwilling to adopt what is really excellent in the other. But it is believed, that the more valuable parts of the two systems may be incorporated, or, in other words, that the peculiar descriptive language

of the one may, in a certain degree, be united to the accurate and scientific arrangement of the other. This union of descriptive language and scientific arrangement has been effected with good success by Brongniart, in his System of Mineralogy—an elementary work, which seems better adapted both to interest and instruct, than any which has hitherto appeared."

Although this book is necessarily compiled, in a great degree, from the writings of others, it contains much valuable information respecting the mineral productions of the United States. It is to this part of the work that we shall confine our remarks; and we feel disposed, for the sake of our general readers, to dwell chiefly on the information Mr. Cleaveland conveys respecting those mineral substances that are connected with the advancement of that active and enterprising people in wealth and political importance, rather than upon the rarer productions, which are only interesting to the mineralogist.

There is one merit of Mr. Cleaveland's book that ought not to pass unnoticed; we mean the form in which it is published. It is printed upon excellent paper, with a neat and perfectly distinct small type; and the same matter is contained in one volume, which, in England, would have been scattered over the surface of three. We should be glad to see it reprinted exactly upon the plan of the original; and we have no doubt that it would be found the most useful work on mineralogy in our language.

Coal exists in several parts of the United States in great abundance. We have already spoken of the vast series of coal strata westward of the Alleghany range, and of an extensive coal formation near Richmond in Virginia. In Pennsylvania, it is found on the west branch of the Susquehannah; in various places west of that branch; also on the Juniata, and on the waters of the Alleghany, and Monongahela. In Connecticut, a coal formation, commencing at New-Haven, crosses Connecticut river at Middletown, and, embracing a width of several miles on each side of the river, extends to some distance above Northampton, in Massachusetts. There are also indications of coal in the States of New-York and New-Jersey. In Rhode Island, anthracite is found, accompanied by argillaceous sandstone, shale with vegetable impressions, &c. similar

to the usual series of coal strata. The coal at Middletown, in Connecticut is accompanied by a shale which is highly bituminous, and burns with a bright flame.

"It abounds with very distinct and perfect impressions of fish, sometimes a foot or two in length; the head, fins, and scales, being perfectly distinguishable. A single specimen sometimes presents parts of three or four fish, lying in different directions, and between different layers. The fish are sometimes contorted, and almost doubled. Their colour, sometimes grey, is usually black; and the fins and scales appear to be converted into coal. The same shale contains impressions of vegetables, sometimes converted into pyrites."

Neither Mr. Cleaveland nor Mr. Maclure give us any information respecting the extent to which the coal has been wrought in any of the numerous places where it has been found, or the thickness of the seams. A scarcity of wood for fuel must be felt before coal will be sought after with much spirit; and there is probably still wanting in the United States that profusion of capital which can be risked in the uncertain operations of mining.

Iron is found in the United States in a great variety of forms, and is worked to a considerable extent. In the year 1810, there were five hundred and thirty furnaces, forges, and bloomeries, in the United States, sixty-nine of which were in the State of New-York; and the iron manufactured at Ancram, New-York, is said to be superior, for many purposes, to the Russian and Swedish iron. It is made from a hematitic brown oxide. Mr. Maclure informs us, that there is a bed of magnetic iron ore, from eight to twelve feet thick, wrought in Franconia, near the White Hills, New-Hampshire; that there is a similar bed in the direction of the stratification, six miles north-east of Philipstown, on the Hudson river; and, still following the direction of the stratification, that the same ore occupies a bed nearly of the same thickness at Ringwood, Mount Pleasant, and Suckusanny, in New-Jersey; losing itself, as it approaches the end of the primitive ridge, near Blackwater—a range of nearly three hundred miles. This immense deposite of iron ore is contained in gneiss, and is accompanied by garnet, epidote, and hornblende. In the State of New-York, mag-

netic iron ore is found in immense quantities on the west side of Lake Champlain, in granitic mountains. The ore is in beds, from one to twenty feet in thickness, and generally unmixed with foreign substances: large beds of this ore extend, with little interruption, from Canada to the neighbourhood of New-York. Clay ironstone is met with in considerable quantities. In Maryland, there are extensive beds of it three miles SW. of Baltimore, composed of nodules formed by concentric layers. Bog iron ore occurs in such abundance in many places, as to be smelted to a great extent.

Copper in the native state, and most of its ores, have been found in different parts of the United States; but there are no mines of this metal except in New-Jersey, and these do not appear to be worked with much success.

Lead has been discovered in a great variety of forms; and there are several extensive mines of it. In upper Louisiana, at St. Genevieve, on the western bank of the Mississippi, there are about ten mines. The ore, which is a sulphuret, is found in detached masses of from one to five hundred pounds, in alluvial deposites of gravel and clay, immediately under the soil; and sometimes in veins or beds, in limestone. One of the mines produces annually about 245 tons of ore, yielding $66\frac{2}{3}$ per cent. There are mines also at Perkiomen, in Pennsylvania, 24 miles from Philadelphia. The ore is chiefly a sulphuret; but it is accompanied by the carbonate, phosphate, and molybdate. In Massachusetts, there is a vein of galena, traversing primitive rocks, six or eight feet wide, and extending twenty miles from Montgomery to Hatfield. The ore affords from 50 to 60 per cent. of lead.

Gold has only been found in North Carolina. It occurs in grains or small masses, in alluvial earths, and chiefly in the gravelly beds of brooks, in the dry season; and one mass was found weighing 28 lib. In 1810, upwards of 1340 ounces of this gold, equal in value to 24,689 dollars, had been received at the mint of the United States.

Native silver, in small quantities, is met with at different places, but in no other form. Mercury and tin have not been found. Cobalt occurs near Middletown, in Connecticut; and a mine of it was at one time worked. Manganese and antimo-

ny are found in several situations. Sulphuret of zinc is found in considerable quantity in Maryland, Pennsylvania, New-Jersey, and Massachusetts. In New Jersey, a new variety of this metal has been discovered, in such abundance, that it promises to be a very valuable acquisition to the United States. It is a red oxide, composed, of zinc 76, oxigen 16, oxides of manganese and iron 8. It is reduced without difficulty to the metallic state.

The chromate of iron, both crystallized and amorphous, occurs in different situations; particularly near Baltimore, and at Hoboken, in New-Jersey. This mineral is employed to furnish the chromic acid, which, when united with the oxide of lead, forms chromate of lead—a very beautiful yellow pigment, of which there is a manufactory at Philadelphia. It is sold under the name of chromic yellow, and is employed for painting furniture, carriages, &c.

In the former part of this article, we have noticed the vast extent of limestone of different species that is spread over the United States. Mr. Cleaveland enumerates several varieties of the primitive limestones in the Eastern States, which are used as marble in ornamental architecture and in sculpture; but he remarks, that the state of the arts has not yet caused them to be extensively quarried, or even sufficiently explored. Some of the Vermont marbles are as white as the Carrara, with a grain intermediate between that of the Carrara and Parian marbles. At Middlebury, in Vermont, during the years 1809 and 1810, 20,000 feet of slabs were cut by one mill, containing 65 saws; and the sales of marble, during the same period, amounted to about 11,000 dollars. In Rhode Island it is found snow white, of a fine grain, translucid, and perfectly resembles the Carrara marble.

Gypsum, or plaster stone, is found in Virginia, Maryland, and Connecticut. It is very abundant in several parts of the State of New-York, particularly in Onondago and Madison counties; also in the vicinity of Cayuga lake, whence, in 1812, 6000 tons of it were exported to Pennsylvania. In many parts of the United States, it has been found an important article of manure in the cultivation of grasses, roots and grain.

Rock salt has not hitherto been discovered; but there are

numerous salt springs. These sometimes flow naturally; but are more frequently formed by sinking wells in those places where the salt is known to exist, as in certain marshes and in salt *licks*, so called from having been formerly the resort of wild animals to *lick* the clay impregnated with the salt. These springs are chiefly found in the country westward of the Alleghany mountains, near the rivers which flow into the Ohio. They occur also in the State of New-York, near the Onondago and Cayuga lakes, associated with the great gypsum formation already noticed. This brine is strong, and yields about 300,000 bushels of salt annually. The whole quantity of salt annually obtained from saline springs in the United States, exceeds 600,000 bushels.

Nitrate of potash, or saltpetre, is met with in considerable abundance. Mr. Cleaveland gives the following description of the situations where it is principally obtained.

"The calcareous caverns which abound in the State of Kentucky, furnish large quantities of nitre. The earths which exist in these caverns, and which contain both the nitrate of potash and the nitrate of lime, are lixiviated; and the lixivium is then made to pass through wood ashes, by the alkali of which the nitrate of lime is decomposed.* After due evaporation, the nitre is permitted to crystallize. One of the most remarkable of these caverns is in Madison county, on Crooked Creek, about sixty miles SE. from Lexington. This cavern extends entirely through a hill, and affords a convenient passage for horses and waggons. Its length is 646 yards, its breadth is generally about 40 feet, and its average height about 10 feet. One bushel of the earth in this cavern commonly yields from one to two pounds of nitre; and the same salt has been found to exist at the depth of 15 feet: even the clay is impregnated with nitrate of lime.

"Kentucky also furnishes nitre under a very different form, and constituting what is there called the *rock ore*, which is in fact a sandstone richly impregnated with nitrate of potash. These sandstones are generally situated at the head of narrow

* "It appears that two bushels of ashes, made by burning the dry wood in hollow trees, contain as much alkali as eighteen bushels of ashes obtained from the oak."

valleys which traverse the sides of steep hills. They rest on calcareous strata, and sometimes present a front from 60 to 100 feet high. When broken into small fragments, and thrown into boiling water, the stone soon falls into sand, one bushel of which, by lixiviation and crystallization, frequently yields 10 lib. and sometimes more than 20 lib. of nitrate of potash. The nitrate obtained from these rocks contains little or no nitrate of lime, and is said to be superior for the manufacture of gunpowder to that extracted from the afore-mentioned earths."

"Masses of native nitre, nearly pure, and weighing several pounds, are sometimes found in the fissures of these sandstones, or among detached fragments. Indeed, it is said that these masses of native nitre sometimes weigh several hundred pounds. Similar caverns occur in Tennessee, and in some parts of Virginia and Maryland."

With the exception of the red oxide of zinc, and the native magnesia, the discovery of which by Dr. Bruce we noticed in our account of his Mineralogical Journal, no simple minerals have hitherto been discovered in the United States that were not already known to exist in other parts of the world. There are some of the simple minerals, however, which are found in a state of great perfection, such as the cyanite, green tourmaline and rubellite, melanite, precious serpentine, garnet and beryll. A mass of native iron has recently been found near Red River in Louisiana. The form is irregular; its length being three feet four inches, and its greatest breadth two feet four inches—its weight exceeds 3000 lib. Its surface is covered with a blackish crust, and is deeply indented. It is very malleable and compact; but it is unequally hard, some parts being easily cut by a chissel, while others have nearly the hardness of steel. Its specific gravity is 7.40. It contains nickel, and is less easily oxidated than purified iron. This is rendered particularly interesting, by its containing in its interior octahedral crystals, which may be easily cut by a knife, and are striated like magnetic iron. The largest crystal is more than half an inch in length.

We look forward with great hopes to the active exertions of our Transatlantic brethren in this interesting field of scientific inquiry; and we shall expect to see the great outline they

have traced, filled up by those detailed examinations of particular districts, where the nature and mutual relations of the different rocks have been diligently and accurately studied. The country occupied by the Granite deserves particular attention, from the fundamental point of theory connected with the history of this rock:—whether, in those situations where it appears to be the lowest rock, there is any evidence of its having been formed subsequently to the strata that cover it;—if any veins are seen to proceed from the great body of the granite, and to penetrate with numerous ramifications the superincumbent rocks, as has been observed in most situations where granite occurs. The great alluvial formation will doubtless afford many valuable illustrations of the changes which the surface of our globe has undergone, from the animal remains with which it is said to abound; and we trust that this important subject of inquiry will be investigated with the attention it deserves. We should be glad to hear of the establishment of a Geological Society, to excite the zeal, and unite the labours of the Geologists of America, and to be the organ of communication between them and the rest of the Scientific World.

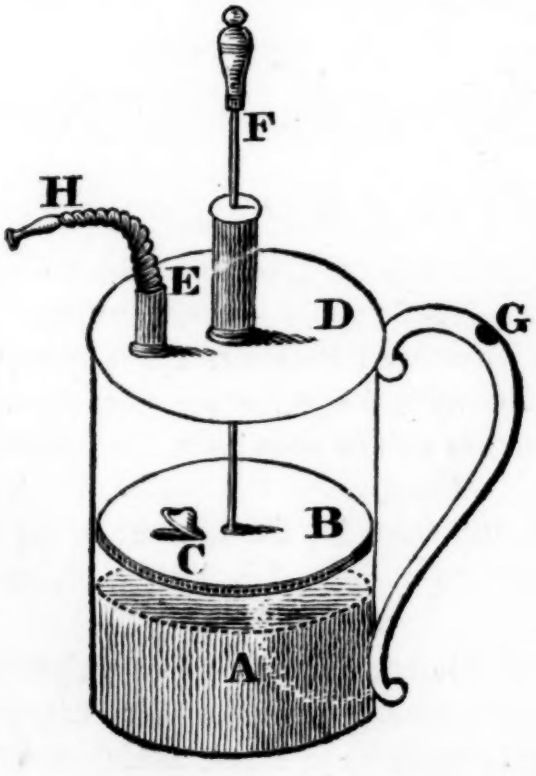
ORIGINAL PAPER.

FOR THE ECLECTIC REPERTORY.

Pons Reading Farm, January 18th, 1819.

DEAR SIR,

I have sometimes thought persons in a weak state of health who have occasion to make use of the Inhaler now in common use, are not always able to draw in a sufficient quantity of steam to answer the intention of it, without being too much exhausted. In order to remedy the evil, I would propose for your consideration, one made on the plan of the drawing enclosed. If it should be found to answer a good purpose, I shall feel myself gratified in having contributed a mite that may in any wise be useful to my fellow creatures.



A is a small cylinder to contain hot water up to the dotted line; B a piston with the valve C in it, that opens when the piston descends, and through which the steam rises above the piston, at the same time the valve at E shuts; when the piston B rises the valve C shuts, and that of E opens and throws the steam into the lungs through the pipe H, and at the same time the air rushes in the hole G and through the handle, into and through the water at the bottom of the cylinder, and rises over the water at A in steam, ready for another discharge and so on alternately. D is the top of the cylinder made to screw on and off, as occasion may require; F is the rod and handle of the piston.

If the patient is not able to work the Inhaler, any person may do it for him.

I am very respectfully,

Yours, &c.

JOSHUA HUMPHREYS.

Dr. T. C. James.

MEDICAL AND PHILOSOPHICAL INTELLIGENCE.

On the first use of Ergot to promote Parturition.

It would appear that the Secale cornutum or Ergot of Rye, which has been of latter years introduced into obstetric practice by Drs. Stearns and Prescott, was *empirically* employed in France, half a century ago, for the purpose of accelerating lingering labours as will be seen from the following,

Extract of a Letter from M. Parmentier to the Abbé Rozier, from Journal de Physique, &c. Volume 4, page 144 for the year 1774.

Voici ce que Madame Dupille, dont la principale occupation semble être le soulagement des malheureux; voici, dis-je, ce qu'elle a eu la bonté de m'écrire concernant l'Ergot.

" J'ai lu, Monsieur, dans le dernier Mercure de Juin 1774, un extrait de vos Ouvrages, touchant le seigle ergoté. Il y a quelques années que j'entendis parler du danger de ce grain et des maladies affreuses, qu l'on prétendoit qu'il avoit causées en Alsace autant que je puis m'en souvenir, ou dans les environs; ce qui me surprit infiniment; car depuis mon Enfance je lui connois une propriété dont je n'ai jamais oui mauvais effets, non plus que ma mere, qui en a fait prendre aux femmes qui ont de la peine á accoucher: je ne sais de qui elle tient cette Recette; elle n'a non plus que moi autre Science en Médecine que l'envie de rendre service aux personnes qui manquent de secours et qui en ont besoin.

" Voici comme elle le fait prendre, et comme j'en ai donné plusieurs fois à différentes femmes, et entr'autres, à la Fermiere Bertichere, prés Chaumont Vexin, lieu que j'habite: elle s'en est bien trouvée, a eu un enfant depuis, et va incessament en avoir un.

" Je pile ce grain (que nous nommons communément *faux seigle*) le plus que je peux; j'en prends ensuite le plein d'un dez à coudre, que je fais avaler dans une cuillerée d'éau ou de vin ou de bouillon, selon que je trouve sous la main.

La Femme qui en a pris, doit accoucher dans le quart-d'heure. Je n'en donne, d'après ce que m'a recommandé ma mere, que lorsqu'on est sûr que l'enfant se présente bien et que le Travail est trop lent; jamais les femmes, qui en ont pris, n'ont été malades aprés; et certainement elles sont plus susceptibles alors de mauvaises impressions que d'autres.

" Votre Dissertation m'a fort rassurée sur les effets de ce grain, que je craignois de faire prendre d'apres tout-ceque j'en avois entendu dire, et me rend la satisfaction de pouvoir delivrer en un quart-d'heure, de ses Souffrances une femme fatiguée d'un travail long et pènible; car ma mere m'a assuree, et j'ai vu effectivement, qu'elles accouchoient dans le quart d'heure."

TRANSLATION.

Madame Dupille, who is chiefly employed in relieving the afflicted, has sent me the following account concerning the Ergot.

Sir, I have read, in the last Mercure of June 1774, an extract from your works, respecting the Ergot.

Several years ago I heard of the dangerous quality of this grain, and of the severe diseases it was said to have produced, either in Alsace, or in its neighbourhood. This was to me a matter of surprise—for, from my infancy I have known it to possess one quality, which has not been followed by any bad consequences. My mother, who has given it to women in difficult labours, has the same experience. I know not where she procured the recipe. Like myself, she has no other medical skill, but a desire to be serviceable to those who want assistance. The following is her method of administering it, and is the same which has been used by me in several cases, and particularly to the wife of a farmer at Bertichere, near Chaumont Vexin, my place of residence. This woman was benefited by it, has had one child since, and is again about being confined.

I give a thimble full of the grain, which we commonly call, *false wheat*, very finely powdered, in a table spoonful of water, wine or weak broth. We look for its effects in a quarter of an hour: according to my mother's recommendation I give it only when the presentation is natural and the labour lingering. The women who have used it, have always enjoyed good health, and we know, that at such times they are more susceptible of disease.

Your dissertation has given me great confidence in the effects of this remedy, which I was doubtful about administering, after what had been said; and I have the satisfaction of being able, in a quarter of an hour, to procure the delivery of a woman, worn out with a lingering and painful labour; for my mother assures me, and I find it to be so, that the delivery is effected in a quarter of an hour.

The following observations are inserted here, having come to hand too late for any other place.

Some Observations on the Varioloid Disease, which has lately prevailed in Edinburgh, and on the identity of Chicken pox and Modified Small pox, in a letter addressed to Dr. Duncan, junior. By JOHN THOMSON, M. D. F. R. S. E.

DEAR SIR, I beg leave to communicate to you the results of some observations which I have had occasion to make in attending to the progress of the eruptive varioloid disease that has lately prevailed in Edinburgh, and of the occurrence of which, in the Military Hospitals, my friend Mr. Hennen has given so accurate and interesting an account in the present number of your Journal.

My attention was first called in a particular manner to this disease, by the cases of it which occurred in the DepotHospital, and by the cases in the Castle, produced by inoculation, with the matter taken from Mr. Hennen's son. Since that period I have seen in various parts of the town seventy two cases of this eruption, including those which have been detailed by Mr. Hennen. Of this number eight have had the disease after having passed through the small pox, twenty-seven after having had the cow pock, two have had the disease co-existent with cow pock, and thirty-five, including the six children who were inoculated in the Castle, had not passed through either small pox or cow pock. Three of the children affected with this disease after cow pock had previously passed through an eruption of the same sort, and in one of these, I have had the best opportunity to observe, that the disease has each time exhibited the appearances which have been supposed to be characteristic of chicken pox.

The greater part of those affected with this disease, who came first under my notice, had previously passed through either small pox or cow pock, or had had the disease communicated to them by inoculation. In watching the appearances and progress of the eruption in these persons, I was for a considerable time inclined to regard it as chicken pox, till having an opportunity of observing its severity and fatality in those who had not under-

gone small pox or cow pock, I was compelled to abandon that idea, and to believe, that in all the different forms under which this eruption has appeared, it could be no other than the small-pox.

This epidemic has attacked three different classes of persons, 1*st*, Those who had passed through small pox; 2*dly*, Those who had had cow pock; and 3*dly*, Those who had had neither small pox nor cow pock, and in all of these it has appeared to possess some common characters. It has usually commenced in a vesicular form, or in a papular, speedily becoming vesicular, and has become pustular only in some cases in its progress. The pustules have appeared sometimes with, and sometimes without a central depression. The eruption has been irregular in size and form, as well as in the place of its first appearance, and in most instances it has appeared to occupy only the surface of the skin. It has in almost all instances come out in successive crops, some of which have appeared on the body after the eruption was at the height on the face. It has in general appeared, even in severe cases, to have arrived at the height on the face by the 6th day of the eruption, and in the milder not unfrequently by the 4th or 5th day. The fluid contained in the vesicles and pustules has in a great number of instances appeared to be lymph rather than pus, even to a late period of the disease, and has generally dried into horny scabs covering tubercular elevations of the skin, which in several instances, have been followed by pits or depressions of that texture. In the decline of the eruption, vesications upon an inflamed basis of a greater or less extent, have frequently appeared upon the extremities, generally filled with lymph, but in a few instances with air; and, in some instances, small abscesses have formed in the subcutaneous texture. This eruption has rarely had any of the smell peculiar to small-pox. It has produced but very little temporary blindness, and has seldom been accompanied by the symptoms of secondary fever.

In four of the eight patients who had had small pox, this epidemic has appeared in a highly aggravated and somewhat malignant form. Comparatively but few, I believe, have ever recovered of primary natural small pox who have had them in number and form similar to those described in Nos. 12, 13, and

14, of Mr. Hennen's cases. The disease in his fourth case, though severe, could not be said to be malignant, and in the other three instances it has been so mild, and of so short duration, that, had these cases occurred before the vaccine inoculation was known, no practitioner of experience would, I am convinced, have hesitated in pronouncing them to be distinct and unequivocal cases of chicken pox.

Of the twenty-nine patients who had undergone cow-pock inoculation, no one has died, and three only have had the disease in a very severe form. In by far the greater part of this class, the eruption has been papular or vesicular, without becoming distinctly pustular, and when it has become so, the pustules have appeared chiefly on the face, while the disease has remained vesicular on the rest of the body. In some of these cases the eruption has been at the height by the third, in others by the fourth, in most by the fifth, and in the severer by the sixth or seventh day. I have not been able to discover in the appearances, progress, or termination of the disease, as it has occurred in those who had been vaccinated, any symptoms by which I could distinguish it from the three varieties of chicken pox described by Dr. Willan, or from the numerous cases of that disease which I had seen before and since the practice of vaccination has been introduced.

Of the twenty-nine patients who have had this disease in the natural way, without having previously passed through cowpock or small pox, nine have died. In five of these fatal cases the disease was of the kind which has been so well described by Dr. Rogers of Cork, and by the late Dr. Walker of this place, under the name of malignant crystalline or water pox. In two of these, petechiæ or livid spots made their appearance before death; three died on the 6th, and two on the 8th day of the eruption. In the other four cases, the disease was pustular and confluent; one died on the 9th, two on the 12th, and one on the 18th day.

In thirteen of those twenty-nine cases, the disease, though it has not proved fatal, has been more or less severe. In several, particularly in adults, it had from the first the appearances which are usually described as characteristics of genuine small-pox, sometimes of the distinct, and at other times of the confluent

kind. In others, the disease had at first the appearance of aggravated chicken pox, rather than of small pox, the eruption coming out in successive crops, and being chiefly vesicular in its first stages, and becoming pustular only in its progress. In very few of the severer cases have there been any symptoms of secondary fever, and these have been mild and of short duration.

In the remaining seven cases the disease was remarkably mild, so much so as to resemble chicken pox, or the inoculated rather than the natural small pox. In these there was comparatively but very little eruptive fever, and in three or four instances the disease seemed to be at the height by the fourth or fifth day. Had not these cases occurred in situations where the malignant small pox existed, I should not have been disposed, from the appearances which manifested themselves, to believe that they could have originated from the infection of genuine small pox.

The history of the progress of this contagion in the military hospitals has been so fully and circumstantially related by Mr. Hennen, as to render it quite unnecessary for me to enter upon it. I shall only remark, that there seems no reason to doubt, that all the cases of mild and malignant small pox which have occurred in the Castle, were derived from matter taken from Mr. Hennen's son. He and his brother appeared to have caught the disease from Serjeant Williamson's son, and this boy again from the patient Wright in the Depot Hospital, who passed through a disease which was regarded as distinct and mild chicken pox. I may add, that, in one of Mr. Hennen's children, the disease was so mild as to escape almost unobserved; and in the other, from whom the matter was taken for inoculation, though the constitutional symptoms were at first severe, the eruption appeared to me to afford, in every step of its progress, one of the best marked cases of chicken pox which had ever come under my observation.

Though in other parts of the town it has been more difficult to trace accurately the progress of the contagion of this epidemic, yet in several situations, the mild and malignant form of the disease have appeared evidently to produce each other. This was particularly obvious in two situations where the disease pre-

vailed extensively, in the different floors of a tenement on the Castle Bank, and in those of another tenement on St. Leonard's Hill. From the fatality of the disease in these two situations among the children who had not been vaccinated, and its aggravated form even in some of those who had been vaccinated, no room was left for doubt that the disease was malignant small pox, though in both situations several children passed through it in a form so mild and so accurately resembling chicken pox as, in my opinion, not to be distinguishable from that disease. I have been informed of the mild form of the disease producing the malignant in unvaccinated persons in three other places of the town besides those I have mentioned, and that too in families in the better condition of life. I hope the different medical practitioners who have witnessed the occurrence of this important fact, will be induced to communicate to the public an account of the circumstances in which they respectively saw it occur.

It was my having seen the disease at first only in its mild form, and among those who had had small pox or cow pock, that induced me to believe, for a long time, that even the aggravated cases which presented themselves to my observation, could only be cases of chicken pox; and I was the more disposed to take this view of it, that I had formed a similar judgment with regard to an epidemical eruptive disease, which I saw prevailing extensively in the villages of Colinton, Slateford, and Currie, during the year 1809. The present epidemic appeared to me to resemble in every particular that which I then had occasion to see, and which, from a careful comparison of its symptoms in the milder cases, with Dr. Willan's description of chicken-pox, I had concluded to be that disease. I was the more confirmed in my belief of these epidemics being chicken pox, from my observing at both periods two symptoms occur in several patients which have been regarded by Dr. Willan and others as diagnostic of chicken-pox. I allude to the succession in the crops of the eruption, and the formation of vesications of greater or less extent, resembling those made by scalding water, occurring among, or in the interstices of the eruption, and producing the appearance which has been termed by some the *swine pox*, and which, in treating of the diseases of the skin, I have been

in the use of pointing out to my pupils as marks by which, in doubtful cases of small pox or chicken pox, they might determine the true nature of the disease. I mention this circumstance with a view to show the reluctance and difficulty which I have had in adopting the conclusions that have forced themselves upon my mind, and which I shall now briefly state to you.

1st, I have been convinced, by the varieties which have appeared in the form of this epidemic in the different individuals whom it has attacked, that the descriptions which have been given of the appearances and progress of the eruption in small pox by our best systematic authors, are, in many respects, imperfect; that the diagnostic marks which have been pointed out between small pox and the disease that has been termed chicken pox, are not to be relied upon; and that no applicable marks of distinction between modified small pox and chicken pox have hitherto been established. My observation would lead me to believe, that the eruption which succeeds to cow pock, has more of a vesicular or varicelloid appearance in infants, than it has in adults, while, in these again, it shows a disposition to become pustular, and exhibits more of the characters of small pox.

2dly, It appears from the records of medicine, that the same person may have small pox twice, (if not oftener,) during life; and the number of cases of this which have lately occurred in so short a time in Edinburgh, and in so limited a number of patients, seems to me to warrant the conclusion, that this must have been a much more common event than has usually been imagined. It is an event which, I conceive, must have occurred frequently, though its occurrence is denied by some, and comparatively but few instances of it are recorded, even by those who believe in its possibility.

3dly, It has been, I conceive, incontrovertibly established by Dr. Jenner and his followers, that cow pock has the property of rendering those who have passed through it, much less susceptible of small pox infection than they were before; and, besides this, that it possesses also the invaluable property of modifying the small pox in those who receive them, and of converting them, from the most fatal of all diseases, to one scarcely, if at all fatal. A sufficient number of observations have not yet been collected to prove satisfactorily, that this last property is

possessed in an equal degree by the small pox, though it seems probable from some, but not all of those cases of secondary small pox which have been recorded, as well as from the result of some of the cases of this kind which have occurred in Edinburgh, that small pox also possess a similar property.

4thly, By admitting that small-pox possess this modifying property, it will follow, that, in the instances in which they exerted this influence previously to the discovery of cow pock, they must have produced a mild and less fatal species of small pox, but a species which has not been recognized or pointed out as differing from primary natural small pox by any author with whose writings I am acquainted. It seems, therefore, probable, that this secondary small pox, which we have now so much reason to believe was of frequent occurrence, must have formed a considerable portion of the varioloid eruptions that were formerly denominated the spurious small pox, and afterwards by some the chicken pox. On the supposition that cow pock preserves from the infection of small pox in an equal degree with small pox themselves (and I am not aware of any facts which tend to prove the contrary,) it will follow that the twenty-seven individuals whom I have mentioned as having had the varioloid disease after cow pock, would, if they had had small pox instead of cow pock, have become affected with small pox a second time, on being exposed to the contagion of this disease, and that too in a form which, previously to the discovery of the cow pock, must have appeared to practitioners as spurious small pox or chicken pox. In this case it is evident that thirty-five of sixty-four of the patients who took the varioloid disease in a natural way, would have passed twice through small pox.

5thly, After Dr. Heberden had distinguished chicken pox from small pox, and had convinced himself and the medical world, that these diseases arise from two contagious poisons, specifically distinct from each other, it seems probable, that the cases of modified secondary small pox which may have occurred, must have been described as cases of chicken pox, since we no where find any hint of the possible co-existence of these two diseases, or of the danger in which medical practitioners are of confounding them together; and also, since we find authors of so great authority as Dr. Monro *Primus*, and

Dr. Heberden, affirming that small pox after small pox is an event of rare occurrence. The former says, "My correspondents almost all agree with me in affirming, that they never saw any attacked by true small pox after they had the true kind, whether communicated by art or by nature;" and the latter, "It would be no extravagant assertion to say, that here, in England, not above one in ten thousand patients is pretended to have had it twice, and whenever it is pretended, it will always be as likely that the persons about the patient were mistaken, and supposed that to be the small pox, which was an eruption of a different nature, as that there was such an extraordinary exception to what we are sure is so general a law."

It therefore appears to me, 6thly, That it now remains to be investigated, in what proportion of the cases, which have been denominated chicken pox, it is probable the disease has been secondary modified small pox; and, upon the supposition of these being two distinct diseases, by what marks we are in future to distinguish them from each other. I can only repeat, that, in a great proportion of the cases of small pox which have occurred to my observation after small pox, as well as in those cases that had been modified by previous cow pock inoculation, I have not been able to distinguish them from chicken pox, but have found every symptom in them to correspond most accurately with the descriptions of the varieties of chicken pox, which have been given by Heberden, Willan, Bateman and others. I am, therefore, satisfied, that previously to the discovery of the cow pock, secondary small pox being a disease frequent in its occurrence, must have stood in nearly the same relation to primary small pox, that modified small pox now stand in to cow pock; and my present impression is, that it may be, that chicken pox and modified small pox are one and the same disease.

I am not aware of any accurate or extensive series of observations which contradict this hypothesis, nor do I think it can well be set aside, till it shall be proved that chicken pox occur generally in persons who have not passed through cow pock or small pox, and prevail epidemically without cases of small pox appearing among them; but of this I find no unequivocal example in the past records of medicine. There are upon re-

cord, it is true, many cases in which the spurious or chicken pox are said to have preceded small pox, and others in which the chicken pox are said to have intervened between the cow pock and the modified small pox. Before, however, admitting that in the production of these cases, there operated two poisons specifically different, it will be necessary to be assured, that the appearances exhibited by chicken pox cannot be produced by the contagion of primary small pox, and *vice versa*, as well as, that the contagion of small pox cannot produce an eruptive disease twice in those who have undergone cow pock inoculation.

It will be necessary also to ascertain, whether those who have passed through small pox in its milder form, are equally secure against a second attack of small pox, as those who have passed through the disease in its more regular and severe form. For if it shall be found that those who have passed through the mild sorts of small pox are less secure against a second attack, than those who have passed through the severe, it will then be rendered probable, that many of the cases which have been considered as cases of chicken pox, preceding small pox, were in fact only cases of mild small pox, similar to some of those which have been produced by the present epidemic, in individuals who had neither passed through cow pock nor small pox, and which exhibited in their appearance the characters that Dr. Heberden has assigned to chicken pox.

Can it be that the hypothesis of the contagion of chicken pox being specifically different from that of small pox, has been had recourse to, in order to explain those cases of secondary small pox which may have occurred after variolous inoculation, and in the benevolent wish of vindicating that practice from the aspersion of its being inefficacious?

7thly, It seems to me certain, that the epidemical disease which has of late prevailed in Edinburgh, is the same with those varioloid diseases which, since the introduction of cow pock inoculation, have been observed in many places of this and other countries, and which have been by some medical practitioners regarded as small pox, and by others as chicken pox. Of this kind, I conceive, was the disease which Mr. Brown of Musselburgh has described, as occurring in forty eight individuals after cow pock inoculation. This author has omitted to mention the period at which the eruption was at the height in ten of his

patients, but in the remaining thirty-eight, it deserves to be remarked, that the eruption was in five of them at the height by the 3d day; in two by the 4th; in twelve by the 5th; in seven by the 6th; in nine by the 7th; and in three by the 8th day; and that no instance is recorded of death having occurred in any of these patients. Through Mr. Brown's statement was made for the purpose of throwing discredit upon the efficacy of cow pock inoculation, the salutary powers of that practice in modifying small pox, seem to me to be established by his cases, beyond all possibility of doubt or cavil. I can have no doubt also, that this is the disease, concerning which the medical practitioners of Forfarshire published a short Report in 1813, and of which Dr. Adams has given a more minute detail in his Inaugural Thesis, printed here in 1814. This gentlemen mentions, in p. 42, that this disease, which the medical men of Forfarshire have concurred in denominating small pox, had occurred in five or six individuals, who had formerly passed through that disease. The efficacy of the cow pock in modifying the small pox, is proved by the testimony of the medical practitioners, as to the mildness of the disease in those who had been vaccinated; and also by the fact, that no patient who appeared to have been properly vaccinated, died of it. The very interesting account given by Dr. Dewar, of the eruptive disease which has appeared lately in Fife, contains many proofs, that the disease which he describes is the same with that which at present exists in Edinburgh. Of seventy cases attacked with this eruption, fifty four had been vaccinated, and of these, one child who had been long in bad health, died. Of sixteen who had not been vaccinated, four died, a proportion wonderfully near, though somewhat less than that of the mortality which has occurred in Edinburgh.

Lastly, It seems to me, that the hypothesis which I have thrown out, if it shall be confirmed by future experience, will afford a satisfactory explanation of the nature of those varioloid diseases which have of late years been observed to succeed to the practice of cow pock inoculation, and will, at the same time, reconcile the various and discordant opinions which have been entertained by medical practitioners, respecting these diseases.

I shall only add, that I feel no anxiety about the fate of this

hypothesis, any farther than that it may tend to promote investigation, in the important subject to which it relates, and to defend the most valuable of all modern discoveries, in the only point in which it can now be supposed to be vulnerable.

A friend, in whose judgment and experience I place the greatest confidence, has been pleased to express himself to me in the following terms: "The opinion suggested by you, that these diseases may all owe their origin to one and the same contagion, if true, would close up much debateable ground—connect and explain many anomalies—simplify our future inquires—and place beyond any doubt the supremacy of vaccination, as a prophylactic of regular small pox. Although the opinion suggested does still appear to me very doubtful, I think you will do quite right to publish your observations at once, and in the way you proposed. This will re-agitate a most important pathological question, and elicit from others, interesting information on many yet doubtful points in the history of those diseases. Though doubtful, however, I am far from thinking your opinion fanciful or unfounded; on the contrary, I could furnish some hints rather favourable to its probability."

Before concluding these observations, permit me to avail myself of this opportunity, to return my best thanks to my friends, Drs. Maclagan, Moncrieff, Tweedie, and Bartlett, and to Messrs. Johnston, Shetky, White, and Thomson, for the opportunities which they have afforded me of seeing the patients affected with this disease under their care; and permit me at the same time to say, that I should feel myself particularly obliged to any of your readers who take an interest in this subject, by their communicating, through the medium of your Journal, or by letter, addressed directly to myself, any facts which may have occurred in their practice, tending either to confirm or to refute the hypothesis, *that small pox, chicken pox, and modified small pox, all proceed from one and the same contagion.* I remain, dear Sir, yours, &c.

5, George Street,
15th September, 1818.

JOHN THOMSON, M. D.

Additional Observations on Varioloid Diseases. By John Thomson, M. D. &c. &c.

[From the Edinburgh Medical and Surgical Journal, No. 57.]

Dear Sir,—Since sending you the "Observations on the Varioloid Disease, &c." I have had occasion to see twelve additional cases of it in Edinburgh. In two of these the disease has occurred in persons who had previously passed through small pox. It has attacked, for the second time, a boy who had been inoculated with cow pox; and it has proved fatal in two instances in which the patients had not passed through small pox or cow pock inoculation.

Having been informed by my friend Mr. William Wood that a varioloid disease, similar to that which had occurred in Edinburgh, was prevailing in the town of Lanark, and at Mr. Owen's cotton mills in that neighbourhood, I visited that place, and found that the disease had prevailed very extensively in the town, but was then beginning to decline. Five instances were mentioned to me by the medical practitioners in which it had proved fatal, but I could not hear of any deaths having taken place among those who had previously undergone vaccination.

At Mr. Owen's mills, through the obliging attention of Mr. Gibson, who has the medical charge there, I had an opportunity of seeing 118 cases of young persons affected with this epidemic. In its general appearances the disease bore a very striking resemblance to that which I have had occasion to see in Edinburgh, though on the whole it appeared to me to have a character considerably milder. Four only of those affected with it had previously passed through small pox; in two of these the disease was mild, but in the other two severe. Eighty two had this disease after having passed through the cow pock. In a few of these it might be said to be severe, but in by far the greater number it was extremely mild, and exhibited the most convincing and agreeable proofs of the efficacy of cow pock in modifying small pox. Thirty-two had the disease without having passed through either cow pock or small pox, and what appeared to me remarkable, it had proved fatal only in

one person of this class. Several, however, had been in imminent danger, and their recoveries may be tedious. Five or six in this class, as well as a considerable number of those who had previously passed through cow pock, had the disease in a form so slight as to agree with the descriptions which have been given of chicken pox rather than small pox. Several individuals had experienced a severe variolous fever without any eruption having appeared, while others had the eruption with little or no fever. The eruption itself varied in quantity from one pustule to a number that was in some instances unaccountable. By a letter which I received last evening from Mr. Gibson, I learn that the disease is still on the increase. One more instance has occurred of its having attacked a boy who had previously passed through small pox, and one where it has attacked, for the second time, a lad who had previously passed through the cow pock. In some of those who have neither undergone cow pock nor small pox, the disease continues, Mr. Gibson informs me, to exhibit the symptoms which have been regarded as characteristic of chicken pox. But I forbear entering more minutely into details, as I am not without hopes that that gentleman may himself be induced, to lay before the public, an account of this epidemic as it has presented itself to his observation.

I have been led to believe, that it might be useful to circulate, among medical practitioners, the following queries; definite answers to which could not fail, I conceive, to remove much of that disagreeable uncertainty which exists at present, with regard to the several points to which these queries relate. They have not, as to some on a first perusal might appear, been hastily drawn up, but are, as well as the conclusions contained in my former letter to you, on which they are founded, the result of much observation, reading, and reflection. I have only to repeat, that I shall be obliged to such of your readers as have had occasion to attend in a particular manner to varioloid diseases, by their communicating to me, through the medium of your valuable journal, or otherwise, any information which may tend to throw light on the different subjects of these queries. I may remark, that in tracing the history of chicken pox, it is particularly desirable that it should be accurately as-

certained in what situations and seasons it has appeared only as a sporadic, and in what as an epidemical disorder.

Query 1*st*, Have you ever had occasion to see Chicken pox prevailing epidemically, without cases of Small pox occurring among them?

2*d*, Have Chicken pox appeared to you to attack those who have not had either Small pox or Cow pock as frequently as those who had passed through these diseases; and have you remarked any difference in the appearance of the eruption in these three several classes of patients?

3*d*, Have any examples occurred in your neighbourhood of persons having had the Small pox twice? and did it appear, in those instances, that the disease was less severe in its second than in its first attack?

4*th*, Has a Varioloid disease occurred to your observation in persons who had passed through regular Cow pock inoculation; and in the instances in which it may have occurred, whether has this disease appeared to you to resemble more Chicken pox or Small pox?

5*th*, Has this Varioloid disease, when it has attacked those who had been vaccinated, proved in any instance fatal?

6*th*, What were the usual symptoms of this disease in those who had not passed through Small pox or Cow pock? Were they those of Small pox, or of the disease which has been termed Chicken pox?

7*th*, In what proportion of persons attacked with this disease, who had not been vaccinated or variolated, has it proved fatal?

8*th*, Have you had occasion to see any instances of modified Small pox, or the disease which has been termed the Chicken pox, occurring oftener than once in the same individual?

9*th* Does the general description which I have given of the Varioloid disease, in the three different classes of persons whom it has attacked in Edinburgh, agree with that of your observation; or in what respect does your observation differ from mine?

10*th*, Are you acquainted with any facts which tend to disprove the hypothesis that Small pox, Chicken pox, and Modi-

fied Small pox, may all arise from one and the same contagion?

I remain, dear Sir, yours truly,

JOHN THOMSON, M. D.

5, George Street, 15th October, 1818.

P. S.—Since sending you the above letter, I have received, among several valuable communications on the subject of Varioloid Diseases, one from Dr. Mudie of St. Andrews, containing a particular account of an eruptive disease which prevailed at that place in the end of the year 1817, and beginning of 1818, resembling in every respect, that which has lately occurred in Edinburgh; and accompanied by a document, proving incontestably, that the idea of variola and varicella, arising from the same contagion, had been forced upon Dr. Mudie by observation, and distinctly expressed by him in a letter to Dr. Macfarlane of Perth, dated 15th April, 1818.

J. T.

5, George Street, 17th October 1818.

Observations on Tetanus, Medical and Surgical. Communicated to the *Société Medicale d'Emulation*, at Paris, by Dr. LOUIS FRANCK, Privy-Counsellor and first Physician to her Highness the Dutchess of Parma.

[From the London Medical and Physical Journal, for September, 1818.]

THE disappointment experienced by anatomists in their inquiries into the origin of this disease, after having been long expressed in useless regret, has at length excited a degree of ardour for the investigaton that promises to lead to the most important results. Dr. John Franck first called the attention of physicians to the spinal marrow, in a memorial on this subject, published in 1791; and his views have been adopted, and the truth of his observations generally acknowledged, throughout Europe. Professor Rachette, a short time since, published

an interesting Treatise on Diseases of the Spinal Marrow; and Dr. Copeland produced, in 1815, a very important work on the same subject. Dr. Franck relates two cases that have lately occurred to the observation of Professor Brera of Padua. The first occurred in a woman, aged twenty-two; it appeared to arise without any evident cause: all the usual remedies were tried without success; she died on the 15th day. On dissection, a considerable quantity of pus was found in the cavity of the abdomen, the consequence of general peritoneal inflammation; the spinal marrow was soft and considerably altered in structure; there was effusion of serum between its coats, and the vessels were much distended with blood.

The subject of the second case was a young man, aged nineteen, who had received a contusion on the thumb of the right hand: twelve days after, he began to feel a stiffness in the motions of the lower jaw, which gradually increased; and, in a few days, he was seized with tetanus. When brought to the hospital, he was covered with a cold sweat, and complained of pain over the whole body, particularly about the lumbar region and along the spinal canal; the face was red and flushed, and the pulse small and contracted. Professor Brera directed a hundred and twenty leeches to be applied along the course of the spine, and prussic acid to be exhibited internally. After the leeches had been applied, relaxation of the muscles came on; but this was succeeded by paralysis, and he soon afterwards expired.

The examination of the body after death was highly interesting: there had been violent inflammation of the spinal marrow, commencing at the situation of the lower cervical vertebræ, and continued to the extremity. But, what was very remarkable, the inflammation was confined to the right side of the spinal marrow, corresponding in this respect with the hand injured.

M. Esquirol's *Observations at the Salpétrière.*

[From the London Medical and Physical Journal, for December, 1818.]

M. Esquirol, a short time since, read a Memoir to the Medical Society of Paris, containing the result of his observations at the *Salpétrière*, during the years 1811, 1812, 1813, and 1814.

The number of insane persons admitted into that hospital during this period was 1,119; ninety-two of whom became insane after child-birth, during lactation, or at the time of ceasing to give suck.

Insanity manifested itself from the first to the fourth day subsequent to delivery, in 16 women;

From the fifth to the fifteenth, in 21;

From the sixteenth to the sixtieth, in 17;

From the sixty-first to within a year, in 19;

Immediately after ceasing to give suck, either voluntarily or forced, in 19.

The development of the malady is consequently more to be feared in women recently delivered, than in those who have given suck for some time; and it becomes more rare as this period is extended.

Of these 92 insane persons, 8 were in a state of folly, 35 in that of melancholy, and 49 were maniacs;—22 were from 20 to 25 years of age; 41 from 25 to 30; 16 from 30 to 35; 12 from 35 to 40; 2 were above 40 years old;—63 were married, 29 unmarried women.—14 became deranged from the action of physical causes, (almost all of them from the impression of cold;) the remaining 78, from moral causes.

Of 55 who recovered, 4 did so during the first month; 7, during the second; 6, during the third; 7, during the fourth; 5, during the fifth; 9, during the sixth; 15, from the sixth to within two years; and 2, after two years.

Of the 37 who were not cured, only six died. Examination of the body after death did not afford any information respecting the cause of the disease.

A singular pathological phenomenon has been noticed by M. Esquirol, in the bodies of many lunatics, after death—the displacement of the transverse portion of the colon; on which he makes the following observations:—

"The ancients and the moderns who have treated of mental alienation, and particularly of melancholy, have all spoken of lesions of the abdominal viscera; but no author has mentioned a displacement of the transverse portion of the colon. A displacement of this intestine may, however, be frequently observed in the bodies of insane persons. Sometimes, the direction of it is oblique; at others, perpendicular, so that its left extremity is situated behind the os pubis.

"This displacement cannot be attributed to mechanic action, dependant on thickening of the coats of the intestine, or a collection of fæces in its cavity; for, in the greater number of subjects that I have examined, the colon was empty, and in all it was in a healthy state as to structure. The same was the case with the ascending and descending portions of it, which, by their relative situation, could draw it from its natural direction. This displacement is not the effect of the last disorder under which the patients die; because this circumstance has been observed in those lunatics who have died of different diseases.

"The insane persons, particularly melancholics, in whom this displacement was observed, frequently complained of pains in the epigastric region, which they described as feeling as though a cord were tied round the body about the hypochondria, and the stools were generally in a bad state. May not these symptoms be explained by the displacement of the colon?

"Have not the ancients, in administering hellebore; and the moderns, in prescribing emetics and drastics, in the treatment of mental alienation, particularly in melancholy; aimed at restoring the healthy state of the abdominal viscera? But, may not purgatives be considered injurious, since they increase debility of those parts? and, thus, have they not taken care to join them with tonics? Lastly, do not sea-voyages, and horse-exercise, so beneficial in melancholy, act by strengthening the abdominal viscera particularly.

"The knowledge of these facts has appeared interesting to me,—1st, because this displacement is frequent in insane persons, particularly in melancholics; 2dly, because an acquaintance with this fact may lead to a more decided and rational mode of treatment in that malady."

UNIVERSITY OF PENNSYLVANIA.

At a public Commencement for conferring Medical Degrees, held at the University of Pennsylvania, April 15th, 1819, the Degree of Doctor of Medicine was conferred upon the following gentlemen, who produced Theses on the following subjects:

CANADA.

George La Rue,	Methodes d'ouvrir les bubons syphilitiques.

CONNECTICUT.

George M'Clellan,	Surgical Anatomy of Arteries.
Alfred L. Munson,	Native Asclepias.

NEW JERSEY.

Frederick Richmond,	Phthisis pulmonalis.
Theophilus E. Beezley,	Emetics.
Samuel M. Fisler,	Amenorrhœa.
Joseph H. Cook,	Hæmoptysis.
William H. M'Calla,	External application of Cold Water.

PENNSYLVANIA.

John Trenor,	Theory of Secretion.
J. P. Freeman,	Influence of the Spinal Marrow.
Abraham Stout,	Utility of Vinegar.
John G. Marshall,	Hæmoptysis.
William Rankin,	Effects of Mercury in Erysipelas.
Chandler Redfield,	History of Medicine.
Stephen Harris,	Croup.
J. Russel Smith,	Blood-letting.
James P. Price,	Catamenia.
William Darrach,	Epidemic at Alms House, 1817.
Jesse R. Burden,	Chimaphila Umbellata.
Benjamin R. M'Connel,	Observations on the Materia Medica.
Frisby H. Snow,	Podophyllum Peltatum.
Chs. N. M'Coskry,	Calomel in Chronic Rheumatism.
Thomas H. Connell,	Ophthalmia.
John S. Irwin,	Hysteritis.
Robert Alison,	Hypopyon.
Obadiah M. Dingee,	Hydrocele.
G. F. Klingle,	Light as a medical agent.
Jesse Coates,	Hydrocele.
William M. Sharp,	Blood-letting.

DELAWARE.

John G. Maxwell,	Laurus Sassafras.
Samuel Sorden,	Vomiting.
William D. Brinckle,	Herpes.

MARYLAND.

John R. Purnell,	Emetics.
Chesed Purnell,	Diarrhœa.
William H. Thomas,	Cynanche Trachealis.

DISTRICT OF COLUMBIA.

Elijah R. Craven,	Suspension of the actions of Life.
Warwick P. Miller,	Suspended Animation.

VIRGINIA.

J. K Mitchell,	Proximate cause of febrile re-action.
William Moseley,	Menstruation.
John Minge,	Neuralgia.
James W. F. Macrae,	Uterine Hæmorrhage.
James Wheatley,	Emetics.
Charles Urquhart,	Anasarca.
William Gwathmey,	Cholera Infantum.
Edwin L. Degraffenreid,	On the influence of the Passions.
Edward Curd,	Uterine Hæmorrhage.
William L. Powall,	Ascites.
Edward M. Ford,	Obstipatio.
William Davis,	Cynanche Trachealis.
Mortimer Williams,	Objections to the sympathetic doctrines of Conception.
Archibald Baldwyn,	Cynanche Trachealis.
H. L. Davis,	Gastritis.
James P. Hill,	Dysentery.
Alfred Murray,	Gout.
James Weeks,	Cholera Infantum.
William A. Sykes,	Remitting Inflammatory Fever.
James W. M. Wallace,	Hydrothorax.
Thomas P. Rives,	Anasarca.
Robert E. Bouldin,	Amenorrhœa.
Littleberry N. Ligon,	Croup.
William R Poindexter,	Typhus Fever.
Hugh G. Seymour,	Hydrocephalus acutus.
Robert W. Carter,	Croup.
Augustus H Garnet,	Tetanus.
Richard A. Christian,	Chronic Inflammation of the Stomach.
Edward Willcox,	Marasmus.
Dick H Egglestone,	Hectic Fever.
William P. Fontaine,	Inflammatory Dysentery of our Climate.
Stirling Ford,	Treatment of Fracture of Extremities.
John D. Spragins,	Calomel.
John T. Ligon,	Epilepsy.
William F. Gooch,	Trachitis.
John H. Patterson,	Peritonitis.
Mordecai C. Booth,	Balsam Copaivi.

NORTH CAROLINA.

Robert Hinton,	Concussion of the Brain.
John C. Smith,	Dysentery.
John Gatling,	Asthma.
Henry L. Plummer,	Dysentery.

SOUTH CAROLINA.

John W. Simpson,	Cholera Infantum.
S. N. Hamilton,	Medical use of Phosphorus.
S. H. Dickson,	Yellow Fever of Charleston, 1817.
St. John Philips,	Oleum Terebinthinæ.
Henry Boylston,	Button Snake root.
Edmund Ravenel,	Dropsy.
Hugh L. Alison,	Regular Gout.
William L. Moultrie,	Best means of promoting Suppuration.

GEORGIA.

Walter H. Weems,	Baptisia Tinctoria.
Abednego Wright,	Puerperal Fever.
Richard H. Randolph,	Bilious Remittent of Georgia, 1817.
G. B. L. Bush,	Asclepias Syriaca.
David Holt,	Nourishment of Fœtus.

KENTUCKY.

Charles H. Warfield,	Hepatitis.
John P. Harrison,	Analogies of Plants and Animals.
Samuel M. Puckett,	Conception.
Harvey Bradford,	Sympathy.
Benjamin T. Bedinger,	Bilious Remittent of Kentucky, 1818.
David J. Ayres,	Sulphur.

TENNESSEE.

William R. Rucker,	Hepatitis.

OHIO.

Cyrus W. Trimble,	Hydrocephalus Internus.

LOUISIANA.

James J. Cosby,	Medical Topography of Louisiana.

MISSOURI TERRITORY.

Hardage Lane,	Tobacco injections in Colica Pictonum.

IRELAND.

John Cullen,	Inflamed and indolent Ulcers.

Interments in the Town of Portsmouth, New-Hampshire, during the Year 1818.

Deaths in each Month.		*Total.*	AGES.				
January,	. . .	11	Under	1	Year		21
February,	. . .	9	From	1	to	5	5
March,	. . . .	8		5	to	10	8
April,	. . . .	11		10	to	20	9
May	. . . .	11		20	to	30	17
June,	. . . .	3		30	to	40	15
July,	. . . .	14		40	to	50	12
August,	. . . .	7		50	to	60	5
September,	. . .	12		60	to	70	8
October,	. . .	11		70	to	80	8
November,	. . .	12		80	to	90	8
December,	. . .	9		90	to	100	2
	Total,	118			Total,		118

Of whom there were, Males 56—Females, 62.

The above mentioned Deaths were caused by the following Diseases and Casualties, viz.

Abscess,	1	Hæmorrhage,	1
Apoplexy,	3	Herpes,	1
Atrophy,	7	Hysteritis,	1
Cholera,	3	Intemperance,	1
Cancer,	1	Inflammation of the Bowels,	1
Consumption,	22	——— Liver,	1
Croup,	2	Pneumonia Typhoides,	4
Dropsy,	3	Scrophula,	3
——— of the Brain,	5	Scirrhus of the Liver,	2
Diarrhœa,	1	Sudden,	3
Erythema,	1	Old Age,	11
Fever, Typhus	21	Unknown Diseases,	6
—— Pulmonic,	4	Casualties, Burnt,	2
—— Puerperal,	1	——— Drowned,	4
—— Inflammatory,	1		
Gangrene,	1	Total,	118

BIRTHS.

Males 124—Females 113—Still Born 7—Total 244.

Abstract of the Bill of Mortality for the town of Salem, (Mass.) *from the 1st of January,* 1818, *to the 31st of December inclusive,* 1818.

Deaths in each Month.	*Total.*	AGES.	
January, - -	13	Under 1 Year	31
February, - -	15	From 1 to 2	14
March, - -	19	2 to 5	11
April, - - -	14	5 to 10	8
May, - -	13	10 to 20	13
June, - - -	17	20 to 30	21
July, - -	19	30 to 40	27
August, - - -	19	40 to 50	14
September, - -	20	50 to 60	14
October, - - -	21	60 to 70	23
November, - -	13	70 to 80	12
December, - -	11	80 to 90	5
		90 to 100	1
Total,	194	Total,	194

The above mentioned Deaths were caused by the following Diseases and Casualties, viz.

Apoplexy, - -	2	Fever Bilious, - -	2
Bleeding, - -	1	—— Inflammatory, -	1
Cancer, - - -	1	Gravel, - -	1
Canker, - -	2	Fits, - - -	7
Colic, - - -	1	Jaundice, - -	1
Cholera Morbus, -	3	Palsy, - - -	4
——— Infantum, - -	4	Angina Pectoris, -	3
Consumption, - -	39	Quinsy, - - -	3
Casualty, - - -	2	Still Born, - -	8
Child Bed, - -	1	Suicide, - - -	3
Dropsy, - - -	4	Throat Distemper, -	2
——— in the Head, -	3	Worms, - - -	5
Dyspepsia, - -	1	Old Age, - -	1
Dysentery, - -	7	Lock Jaw, - -	1
Drinking Cold Water,	1	Uncertain, - -	44
Drowned, - - -	3	Intemperance, - -	15
Fever, - - -	5		194
—— Lung, - -	5		
—— Typhus, - -	8		

Of these were—Males, 95, Females, 99.

The Deaths at the Alms-House, contained in the above, were 17.

Published by order of the Board of Health,

J. P. SAUNDERS, Sec'ry.

Abstract of the Bill of Mortality for the town of Boston, from the 31st of December, 1817, to 1818, agreeably to the Record kept at the Health Office.

1818.	Un. 1 yr.		fr. 1 to 2		2 to 5		5 to 10		10 to 20		20 to 30		30 to 40		40 to 50		50 to 60		60 to 70		70 to 80		80 to 90		90 to 100		Total.
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
January,	4	4	2	2	2	2	1	0	0	0	3	3	5	4	5	6	9	4	2	1	3	4	1	3	0	1	71
February,	6	8	3	4	3	1	1	0	0	0	3	3	3	3	6	4	1	2	3	2	1	2	0	0	0	1	60
March,	15	14	5	6	2	2	0	0	3	2	4	4	4	3	6	6	5	4	2	2	1	0	1	0	0	0	91
April,	8	10	2	4	3	2	0	0	1	1	0	1	7	7	7	5	3	4	4	4	4	1	0	0	1	0	79
May,	6	5	3	2	4	0	4	2	1	4	8	3	3	7	3	1	5	1	2	4	3	4	2	1	0	0	78
June,	5	6	4	6	2	1	3	2	1	2	5	4	5	6	6	4	5	5	4	1	2	2	0	2	0	0	83
July,	7	5	3	4	2	0	0	2	4	3	5	3	4	5	4	5	5	2	2	3	2	3	1	0	1	0	75
August,	8	9	2	2	5	2	1	1	5	0	7	4	4	6	6	3	3	2	2	2	1	1	0	1	0	0	77
September,	6	7	9	7	3	4	2	2	3	1	4	5	6	4	3	2	5	4	3	4	3	1	0	0	0	0	88
October,	8	8	5	4	4	2	2	3	2	1	6	10	8	4	5	5	4	4	6	5	3	3	2	0	0	0	104
November,	3	4	8	5	2	3	3	1	3	3	7	7	5	2	4	5	4	4	3	4	1	3	2	3	0	0	89
December,	7	9	3	3	3	3	1	5	3	0	6	5	3	5	5	3	2	2	3	3	1	0	0	1	0	0	76
Total,	83	89	49	49	35	22	18	18	26	17	58	52	57	56	60	49	51	38	36	35	25	24	9	11	2	2	971

The above Deaths were caused by Diseases and Casualties as follows, viz.

Abscess	5	Cramp,	1	Dysentery,	4	Fits	24	Intemperance,	2	Scrophula	2
Accidental,	1	Croup,	5	Dysury,	1	Gout,	1	Measles,	1	Spasms,	4
Aneurism	1	Cynanchemaligna	1	Fever, Bilious,	7	Gravel,	1	Mortification,	4	Still Born,	46
Angina Pectoris	5	Debility,	2	—— Intermittent	1	Hepatitis,	5	Old Age,	32	Suicide,	4
Apoplexy	9	Dis. unknown,	246	—— Inflam.	5	Hernia,	1	Palsy,	6	Sudden,	12
Burns	2	Drink. cold water	2	—— Nervous,	2	Hæmorrhagia	4	Phrenitis,	1	Ulcers,	1
Cancer	3	Dropsy,	23	—— Pulmonic,	36	Hooping Cough,	2	Pleurisy,	3		
Casualty,	10	Dyspepsy,	12	—— Putrid,	1	Hydroceph. Int.	4	Quinsy	4		
Cholera,	3	Drunkenness,	1	—— Puerperal,	4	Infant Diseases	156	Rickets,	2		
Consumption,	138	Drowned,	12	—— Typhus	112	Inflam. of Brain	1	Scalds,	3	Total,	971

Boston, Jan. 9, 1819.

Published by order of the Board of Health,
JAMES ROBINSON, *Secretary.*

Report of Deaths in the City and County of New York, for the year 1818.—*Published by order of the Common Council.*

In Common Council, Jan. 11, 1819.

The City Inspector has the honour to present the annual Report of Deaths, in the City and County of New York, for the year 1818.

Respectfully submitted,
GEORGE CUMING, City Inspector.

Ordered, That the same be published.

From the Minutes,
J. MORTON, Clerk.

An annual Report of Interments in the City and County of New York; commencing on the first day of January, and ending on the thirty-first day of December, 1818; *showing the ages, sexes, and diseases of the persons who died.*

Deaths in each Month.	*Total.*	AGES.	
January,	230	Under 1 Year	783
February,	221	From 1 to 2	328
March,	254	2 to 5	198
April,	250	5 to 10	101
May,	221	10 to 20	134
June,	227	20 to 30	383
July,	235	30 to 40	425
August,	386	40 to 50	359
September,	363	50 to 60	239
October,	297	60 to 70	140
November,	232	70 to 80	110
December,	259	80 to 90	51
		90 to 100	12
		100 and upwards	2
Total,	3265	Total,	3265

Men 984—Women 736—Boys 857—Girls 688.

Inflam. of Brain 1 | Scalds, 3 | Drunkenness, 12 | Typhus 112 | Drowned, 138 | Consumption, 138 | Cholera,
Published by order of the Board of Health, JAMES ROBINSON, Secretary.
Boston, Jan. 9, 1819.

The above mentioned Deaths were caused by the following Diseases and Casualties, viz.

Abscess,	13	Inflammation of the Bladder,	3
Apoplexy,	46	——— Bowels,	55
Asthma,	6	——— Brain,	19
Burned or Scalded,	16	——— Chest,	89
Carbuncle,	1	——— Liver,	29
Cancer,	11	——— Stomach,	6
Caries,	1	Insanity,	13
Casualty,	41	Intemperance,	38
Catarrh,	3	Killed,	2
Child-bed,	8	Locked Jaw,	5
Chlorosis,	1	Lumbar Abscess,	1
Cholera Morbus,	64	Manslaughter,	1
Colic,	4	Marasmus,	14
Consumption,	591	Measles,	18
Convulsions,	201	Menorrhagia,	1
Contusion,	3	Mortification,	12
Cramp in the Stomach,	9	Nervous Disease,	3
Diarrhœa,	46	Old Age,	92
Drinking Cold Water,	16	Palsy,	46
Dropsy,	88	Peripneumony,	39
——— in the Chest,	47	Pleurisy,	27
——— in the Head,	106	Pneumonia Typhoides	20
Drowned,	52	Quinsy,	4
Dysentery,	141	Rheumatism,	8
Dyspepsia,	8	Rickets,	1
Epilepsy,	4	Rupture,	1
Erysipelas,	3	Scirrhus of the Liver,	1
Fever,	47	Scrofula, or King's Evil,	19
—— Bilious,	9	SMALL POX,	19
—— Hectic,	3	Sore Throat,	5
—— Inflammatory,	10	Spasms,	8
—— Intermittent,	7	Spina Bifida,	1
—— Puerperal,	3	Sprue,	23
—— Putrid,	1	Still-born,	159
—— Remittent,	7	Stone,	1
—— Typhus,	263	Strangury,	4
Flux, Infantile,	68	Sudden Death,	21
Fracture,	1	Suicide,	24
Gout,	4	Syphilis,	14
Gravel,	6	Tabes Mesenterica,	111
Hæmorrhage,	9	Teething,	39
Hæmoptysis,	8	Tumor,	1
Herpes,	1	Ulcer,	7
Hives or Croup,	74	Unknown,	43
Hysteria,	1	Whooping Cough,	123
Jaundice,	10	Worms,	28
Infanticide,	5	Total,	3265

REMARKS.

The City Inspector respectfully reports to the Board, a statement of the deaths in the City and County of New-York, for the year 1818, amounting to three thousand two hundred and sixty-five, being an increase of seven hundred and thirty-eight above that of the preceding year.

In consequence of the excessive heats that prevailed during the summer months of the past year, a greater number of deaths took place, during those months, than was usual in former years; this circumstance, combined with the increase of our population, to which may be added the constant influx of emigrants, many of whom being of the poorer class, and unaccustomed to our climate, may account for the number of children that died of distempers peculiar to our summer months, in an atmosphere unusually rarefied.

The returns of deaths received from Baltimore and Philadelphia, however, sufficiently prove, that the climate of New-York is as salubrious as that of her sister cities; to exemplify which we need only observe, that in the year 1817, the deaths in Baltimore, (with a population, perhaps *thirty thousand*) amounted to *thirteen hundred* and *twenty*, whilst in our city, containing a population at least *four times* greater, we had not more than twice that number.

The fortunate exemption of our city from the pestilential visitation of the *Yellow Fever*, is justly a subject of general gratulation, and solemn thankfulness, and it is to be hoped that the same vigilance that, under Providence, has guarded us from its scourge, will be the means of shielding our city from its future visitations.

GEORGE CUMING,

City Inspector.

New-York, Jan. 11th, 1819.

Statement of Deaths, with the diseases and ages, in the City and Liberties of Philadelphia, from the 1*st of January* 1818, *to the* 1*st of January* 1819.

DISEASES.	Under 1 year	From 1 to 2	From 2 to 5	From 5 to 10	From 10 to 15	From 15 to 20	From 20 to 30	From 30 to 40	From 40 to 50	From 50 to 60	From 60 to 70	From 70 to 80	From 80 to 90	From 90 to 100	From 100 to 110	Total
Apththæ	4	0	0	0	0	0	0	0	1	0	0	0	0	0	0	5
Asthma	0	0	1	0	0	0	0	0	1	1	4	1	0	0	0	8
Abscess	0	1	0	1	0	0	5	3	0	1	0	0	0	0	0	11
Atrophy	12	9	1	4	0	0	2	3	4	2	5	4	0	0	0	46
Apoplexy	0	1	0	0	0	0	6	3	7	8	9	5	1	0	0	40
Angina Pectoris	1	0	0	2	0	0	0	0	3	3	0	0	0	0	0	9
Aneurism	0	0	0	0	0	1	0	0	2	0	0	0	0	0	0	3
Burns	0	1	4	1	0	0	5	2	0	0	0	0	0	0	0	13
Cholera Morbus	105	68	19	3	1	0	0	2	4	1	0	0	0	0	0	203
Catarrh	8	0	1	1	0	0	1	3	0	1	1	0	0	0	0	16
Consumption of the Lungs	4	8	2	3	3	22	95	127	70	53	14	12	3	0	0	396
Convulsions	107	7	3	4	1	1	4	5	2	3	2	1	1	0	0	141
Chorea	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
Casualties	5	0	1	1	3	0	4	5	10	1	0	1	0	0	0	31
Cancer	0	0	0	0	0	0	1	0	1	0	0	1	1	0	0	4
Caries	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	3
Colic	0	1	0	0	0	0	0	1	2	2	1	0	0	0	0	7
Debility	38	4	4	2	0	1	7	5	5	5	9	7	2	0	0	89
Dyspepsia	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	3
Dysentery	7	5	2	3	0	0	4	5	2	1	2	0	0	0	0	31
Dropsy	4	1	3	3	2	2	16	19	20	9	7	9	3	1	0	99
in the Head	24	20	11	10	2	0	0	0	0	0	0	0	0	0	0	67
in the Breast	0	0	0	0	0	0	1	2	0	0	0	2	0	0	0	5
Decay	4	7	1	1	0	0	1	5	7	1	3	7	1	0	0	38
Diarrhœa	9	6	4	0	0	0	2	10	6	5	3	1	2	0	1	49
Drowned	0	0	1	3	3	3	14	12	2	1	0	0	0	0	0	39
Drunkenness	0	0	0	0	0	1	2	3	3	0	1	0	0	0	0	10
Drinking cold water	0	0	0	0	0	0	4	2	1	0	2	0	0	0	0	9
Diabetes	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Epilepsy	0	0	1	0	0	1	2	3	1	1	0	0	0	0	0	9
Erysipelas	3	0	1	0	0	0	0	0	0	1	1	0	0	0	0	6
Fever	8	3	2	1	1	0	11	9	8	4	5	4	2	1	0	59
Typhus	0	0	1	1	4	7	70	86	66	40	23	7	5	1	0	311
Puerperal	0	0	0	0	0	1	7	8	0	0	0	0	0	0	0	16
Remittent	1	2	3	0	2	4	8	14	11	6	4	0	0	0	0	55
Bilious	0	0	0	0	1	1	9	9	8	3	3	0	0	0	0	34
Nervous	0	0	0	0	1	2	1	2	4	0	0	0	1	0	0	11
Inflammatory	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	3
Intermittent	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	3
Hectic	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	3
Scarlet	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Gangrene	4	0	1	0	1	0	2	2	2	1	3	1	3	0	1	21
Gout	0	0	0	0	0	0	0	1	0	0	1	1	2	0	0	5
Hives	17	16	12	3	0	0	0	0	0	0	0	0	0	0	0	48
Hooping Cough	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	6
Carried over,	371	161	82	49	25	48	286	354	256	137	104	65	27	3	2	1969

	Under 1 year	From 1 to 2	From 2 to 5	From 5 to 10	From 10 to 15	From 15 to 20	From 20 to 30	From 30 to 40	From 40 to 50	From 50 to 60	From 60 to 70	From 70 to 80	From 80 to 90	From 90 to 100	From 100 to 110	Total
Brought forward,	371	161	82	49	25	48	286	354	256	137	104	65	27	3	2	1969
Hæmorrhage	1	0	0	1	0	0	0	1	1	1	0	0	0	0	0	6
Hernia	0	0	1	0	0	0	1	1	0	1	0	0	0	0	0	4
Insanity	0	0	0	0	0	0	13	14	5	8	1	0	0	0	0	41
Jaundice	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	4
Inflammation of the Brain	3	3	0	4	2	2	3	3	1	1	0	0	0	0	0	22
of the Lungs	12	5	6	1	0	1	6	12	2	1	1	2	0	0	0	49
of the Stomach	8	1	2	0	1	1	4	4	6	2	3	0	0	0	0	32
of the Bowels	20	3	3	2	0	2	5	3	1	0	1	2	2	0	0	44
of the Liver	2	0	1	0	0	0	4	6	2	4	0	1	1	0	0	21
of the Bladder	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2
Locked Jaw	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	3
Old Age	0	0	0	0	0	0	0	0	0	0	2	8	33	19	3	65
Pleurisy	4	1	2	1	1	1	5	3	1	1	3	2	0	0	0	25
Palsy	0	0	0	0	1	1	3	2	7	10	9	2	2	0	0	37
Rheumatism	0	0	0	0	0	1	0	2	0	1	2	3	1	0	0	10
Rickets	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2
Syphilis	1	1	0	0	0	0	7	3	0	0	0	0	0	0	0	12
Suffocation	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0	4
Scrofula	1	2	3	2	1	0	1	4	1	2	1	0	0	0	0	18
Still Born	156	0	0	0	0	0	0	0	0	0	0	0	0	0	0	156
Sudden	2	0	0	0	0	0	5	6	4	4	8	0	0	0	0	29
Sore Throat	6	2	5	3	0	0	1	0	0	0	0	0	0	0	0	17
Spina Bifida	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	2
Suicide	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Small Pox natural	0	0	1	1	1	1	3	0	1	0	0	0	0	0	0	8
Scirrhus of the Stomach	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	3
Spasm in the Stomach	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
Stone	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	2
Tabes	5	1	2	0	0	0	3	0	0	0	0	0	0	0	0	11
Teething	6	10	1	0	0	0	0	0	0	0	0	0	0	0	0	17
Ulcers	0	0	0	0	1	0	2	1	2	1	0	0	0	0	0	7
Worms	1	3	3	0	0	0	0	0	0	0	0	1	0	0	0	8
Unknown	26	20	6	2	2	1	17	22	23	8	1	2	0	0	0	132
Total,	628	214	118	68	35	59	370	446	316	187	138	90	67	24	5	2765

NOTE. Of the above there were 925 males of twenty years and upwards, 512 under twenty years: of females, 754 of twenty years and upwards, 441 under twenty years; and 133 children, principally under one year, whose sex is unknown.

Deaths in each month of the above period.

	Adults.	Children.	*Total.*
January	163	72	235
February	150	61	211
March	151	89	240
April	161	75	236
May	138	66	204
June	149	71	220
July	143	178	321
August	137	175	312
September	105	118	223
October	95	74	169
November	139	59	198
December	120	76	196
Total	1651	1114	2765

By order of the Board of Health,

JOSEPH PRYOR, Clerk.

Health Office, February 3d, 1819.

Report of Interments in the City of Baltimore, from the first day of January, 1818, to the first day of January, 1819, taken from the Records of the Board of Health.

Deaths in each month.	Males.	Females.	Total.	Of whom colored.
January,	63	50	113	41
February,	65	44	109	43
March,	52	36	88	29
April,	72	60	132	48
May,	65	39	124	50
June,	64	48	112	31
July,	143	108	251	68
August,	158	84	242	71
September,	108	95	203	53
October,	106	88	194	54
November,	61	47	108	32
December,	98	58	136	54
Totals,	1055	757	1812	574

AGES.	
Still Born,	96
1 year and under,	499
From 1 to 2	190
2 to 5	53
5 to 10	62
10 to 20	154
20 to 30	251
30 to 40	210
40 to 50	107
50 to 60	69
60 to 70	43
70 to 80	37
80 to 90	26
90 to 100	13
100 to 110	2
Total,	1812

Places of Interment.	Adults.		Children.		Total.	Of whom colored.
	Men.	Women.	Boys.	Girls.		
Alms House Burial Ground,	50	35	6	5	96	32
Baptist—First,	7	10	8	3	28	1
——— Second,	8	8	5	1	22	1
Dunkard's,	0	0	2	0	2	0
Episcopalians—Christ Church,	9	7	9	6	31	0
——— St. Paul's,	23	11	17	6	57	0
——— St. Peter's,	6	7	9	5	27	1
——— Trinity,	5	6	8	7	26	0
Friends— East of Jones' Falls,	5	0	4	3	12	0
——— West of do.	1	1	0	1	3	0
German—Lutheran,	32	14	16	18	80	0
——— Reformed,	10	1	10	3	24	0
——— Evangelical Reformed,	4	2	1	0	7	0
Methodist—African,	14	32	21	38	105	105
——— Bethel,	0	0	0	0	0	0
——— Eutaw,	0	0	0	0	0	0
——— Fell's Point,	23	18	27	28	96	19
——— Light Street,	29	26	53	21	129	0
——— Old Town,	42	24	56	33	155	0
New Jerusalem Temple,	4	1	2	2	9	0
Amount carried forward,	272	203	254	180	909	159

Amount brought forward,	272	203	254	180	909	159
Potters Field—East - -	129	62	73	52	316	211
——— West, - -	39	44	71	43	197	184
Presbyterians—First, - -	19	12	12	17	60	0
——— Second, - -	11	7	13	9	40	0
——— Associate Reformed,	2	5	13	7	27	0
Roman Catholic—St. John's,	8	2	5	6	21	2
——— St. Patrick's,	24	20	33	17	94	10
——— St. Peter's,	34	41	41	30	146	8
Jews, - - - - -	1	0	1	0	2	0
Total,	539	396	516	361	1812	574

DISEASES.

Apoplexy, - - -	2	Hives, - - - -	3
Asthma, - - -	6	Jaundice, - - -	4
Burn, - - - -	7	Intemperance, - -	14
Catarrh, - - - -	3	Inflammation, - -	3
Cancer, - - - -	7	——— of the Lungs,	29
Casualty, - - -	19	——— of the Bowels,	4
Child-Bed, - - -	19	——— of the Brain,	14
Cholera-morbus, - -	280	Influenza, - - -	2
Colic, - - - - -	15	Locked Jaw, - - -	3
Consumption, - -	306	Mortification, - -	23
Convulsions, - - -	115	Murdered, - - -	3
Cramp in the Stomach, -	1	Mumps, - - -	1
Croup, - - - -	52	Old Age, - - -	62
Decay, - - - -	86	Palsy, - - -	12
Dropsy, - - -	37	Pleurisy, - - -	63
——— in the Head, -	18	St. Anthony's Fire, - -	2
Drowned, - - -	27	SMALL POX, - -	1
Dysentery, - - -	31	Sore Throat, - -	1
Fever, - - - -	3	Still Born, - - -	96
—— Bilious, - -	70	Sudden Death, - -	34
—— Intermittent - -	6	Suicide, - - -	9
—— Nervous, - -	7	Teething, - - -	16
—— Remittent, - -	1	Whooping Cough, - -	1
—— Typhus, - -	85	Worms, - - -	91
Flux, - - - - -	6	Unknown, - - - -	109
Gravel, - - - -	2		
Gout, - - - -	1	Total,	1812

By order of the Board of Health,
SAMUEL YOUNG, Sec'ry.

N. B. In noting the increased number of Deaths, reported during the last year, it is proper to observe, that the interments from the Alms House, were not included in any former report—The Commissioners of Health deem it their duty again to remark, as one great benefit resulting from the publication of these annual lists of mortality, is the ascertaining with correctness, the predo-

minant diseases of each season, to do which it is necessary to note with technical precision, the different disorders that have proved fatal; at the same time that they lament their present limited means for accomplishing this object, avail themselves of the present opportunity to solicit the aid of all practising Physicians and relatives of diseased persons, that by communicating information to the respective Sextons where interments take place, of the cause of the deaths that may happen, the difficulty they at present labour under may be obviated, and the future annual bills of mortality be presented to the public with all possible accuracy.

Interments in the City of Richmond, Virginia, in the Year 1818.

Deaths in each Month.	*Total.*	AGES.	
January,	10	Under 1 Year	77
February,	7	From 1 to 3	25
March,	16	3 to 5	15
April,	11	5 to 10	9
May,	15	10 to 20	11
June,	16	20 to 30	37
July,	36	30 to 40	29
August,	39	40 to 50	11
September,	34	50 to 60	13
October,	27	60 to 70	14
November,	15	70 to 80	1
December,	16	80 to 90	0
Total,	242	Total,	242

The above mentioned Deaths were caused by the following Diseases and Casualties, viz.

Asthma,	1	Hydrophobia,	2
Apoplexy,	3	Intemperance,	2
Affection of the Brain,	1	Jaundice,	1
Accidental Deaths,	4	Liver Complaint,	5
Bowel Complaint and Teething,	63	Measles,	2
		Pleurisy,	5
Consumption,	18	Quinsy,	1
Child Bed,	5	Rheumatism	1
Cholera Morbus,	1	Still Born,	18
Colic,	1	Sudden Deaths,	3
Cold,	3	Strangulated Hernia,	1
Croup,	1	St. Anthony's Fire,	1
Convulsions,	3	Unknown,	4
Debility,	46	Worms,	4
Dropsy,	4	Whooping Cough,	1
Fever, Bilious,	31		
—— Nervous,	5		
Hæmorrhage,	1	Total,	242

Return of Deaths in the City of Charleston, S. C. from the first of October, 1817, to the first of October, 1818.

Deaths in each Month.		*Total.*	AGES.		
October,	. . .	128	Under 3 Years		324
November,	. . .	88	From 3	to 10	84
December,	. . .	64	10	to 20	57
January,	. . .	55	20	to 30	124
February,	. . .	65	30	to 40	132
March,	. . .	74	40	to 50	98
April,	. . .	63	50	to 60	65
May,	. . .	71	60	to 70	53
June,	. . .	89	70	to 80	34
July,	. . .	111	80	to 90	19
August,	. . .	119	90	to 100	3
September,	. . .	76	100	to 110	0
			110	to 120	2
Total,		995	Total,		995

The above mentioned Deaths were caused by the following Diseases and Casualties, viz.

Abscess,	 4	Influenza,	. . . 1
Accident,	. . . 15	Inflammation of the Brain,	2
Apoplexy,	. . . 8	—— Lungs,	. 11
Asthma,	. . . 8	Insanity,	 4
Cancer,	 8	Intemperance,	. . . 7
Catarrh,	 21	King's Evil,	. . . 4
Chicken Pock	. . . 2	Liver Complaint,	. . 7
Child Bed,	. . . 14	Lock Jaw,	. . . 20
Colic,	 7	Mortification,	. . . 2
Consumption,	. . . 151	Old Age,	. . . 46
Convulsions,	. . . 37	Palsy,	 6
Cramp,	 5	Pleurisy,	. . . 7
Croup,	 7	Rash,	 1
Debility,	 69	Rheumatism,	. . . 5
Diarrhœa,	. . . 79	Rupture,	. . . 1
Dropsy,	 64	Scrophula,	. . . 3
Drowned,	. . . 21	Scurvy,	. . . 1
Dysentery,	. . . 7	Sore Throat,	. . . 11
Fever, Bilious,	. . . 40	Spasm,	 11
—— Catarrhal,	. . 19	Sudden death,	. . . 8
—— Hectic,	. . . 3	Suicide,	. . . 3
—— Nervous,	. . 15	Teething,	. . . 43
—— Typhus,	. . . 17	Thrush,	. . . 7
—— Worm,	. . . 52	Unknown,	. . . 22
—— Yellow,*	. . . 38	Violence,	. . . 2
Gravel,	 1	Whooping Cough,	. . 41
Jaundice,	. . . 3	White Swelling,	. . 1
Imposthume,	. . . 1		
		Total,	995

[* See page 296.]

Of the foregoing there were—		
Males, - - -	572	
Females. - -	423	
Of whom there were—	——	995
Whites, - -	404	
Blacks, - -	591	
	——	995

The cases of Consumptions were generally Strangers, who came to Charleston for the benefit of their health.

By order of the Board,

JAMES A. MILLER, Clerk.

Examined and found correct,

DANIEL STEPHENS,

November 12, 1818. Chairman.

* The Yellow Fever Cases occurred during the months of October and November of the year 1817.—If the respectable gentlemen composing the Board of Health of the City of Charleston, had seen the propriety of commencing their Report, as is done in other Cities of the United States, on the first day of January, and closing it on the last day of December, in each year, the term Yellow Fever would not have been mentioned in the preceding Report, as no case of it occurred in Charleston during the year 1818.

LONDON BILL OF MORTALITY.

A general bill of all the Christenings and Burials, from December 16, 1817, *to December* 15, 1818.

Christened in the 97 Parishes within the walls, 1048; Buried, 1204.

Christened in the 17 Parishes without the walls, 5317; Buried 4078.

Christened in the 23 out-Parishes in Middlesex and Surrey, 13,410, Buried, 10,099.

Christened in the 10 Parishes in the City and Liberties of Westminster, 4,458; Buried, 4324.

Christened—Males, 12,530; Females, 11,703. In all 24,233.

Buried—Males, 9383; Females, 9822. In all 19,705.

OBITUARY.

Died in Philadelphia, February 22d, 1819, Dr. Isaac Cathrall, aged fifty-five years.

On the 29th of March, 1819, Dr. Joshua Kersey, aged thirty-eight years.

Died April 1st, 1819, Dr. James Dunlap, aged seventy years.